ARCHIVES OF OPHTHALMOLOGY.

DACRYOCYSTO-RHINOSTOMIA (TOTI'S OPERATION).

WITH A REVIEW OF THE SURGICAL TREATMENT OF LACHRYMAL OBSTRUCTION.[1]

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STENOSIS of the nasal duct and the subsequent chronic dacryocystitis are exceedingly unpleasant to the patient and dangerous to the eyes. The treatment of these diseases is so far one of the unsolved problems of medical science, though numerous and various methods and operations are advised, which tend to relieve the patient. It is not my intention to discuss all of them in this short publication and therefore I shall mention only the most important and most frequently used procedures.

The procedures may be divided into two groups: (1) radical; (2) conservative.

The radical methods strive to cure the disease by destroying or removing the lachrymal sac by (*a*) chemicals, (*b*) excochleation, (*c*) destruction by Paquelin or galvanocautery, (*d*) excision of the sac. From all these procedures extirpation of the sac is used nowadays, as the only one which is in accordance with modern surgery. It is universally adopted in ophthalmology, and is the operation almost exclusively used for chronic dacryocystitis. It surely is the quickest and most radical operation, stopping the secretion and thereby eliminating at once the danger of infected ulcer of

[1] Read before the Section on Ophthalmology, New York Academy of Medicine, January 16, 1911.

the cornea, but there always remains the very unpleasant epiphora, which may cause eczema of the eyelid and blepharitis. The tearing furthermore compels the patient to wipe his eye continuously with his often soiled hands and handkerchief, and is very often the cause of various forms of conjunctivitis, styes, and other external infectious diseases of the eye. I have never experienced the cessation of the tearing 6 or 8 months after the operation, as it is mentioned in the various text-books on ophthalmology. To stop the tearing and its consequences, a second operation is necessary: the total extirpation of the lachrymal gland. Though I have performed it several times, I have never seen satisfactory results either from extirpation of the accessory lachrymal gland or from partial extirpation of the main gland.

There is quite a legion of conservative procedures, which strive to restore the drainage of the tears into the nose. They may be divided into two main groups: first, the methods which intend to restore the permeability of the nasal duct, and second, those that strive to cure the disease by making a new channel for the tears through the bony wall of the nose.

From the former group the probing with Bowman's probes, followed by syringing the duct with various antiseptic or astringent solutions, is the most commonly and almost exclusively used procedure. This treatment is exceedingly slow. Probing must be continued for six or eight months and sometimes longer, so that it drags on the patience of the physician as well as the patient. Most patients cannot submit to this treatment because of their occupation or living far away from the physician, then the probing itself is rather painful, and finally, the main objection, that it is in most cases unsuccessful. Fuchs himself says in his text-book that permanent result with probing is one of the rarest exceptions. I think it quite natural, because with probing we do not cure the cause of the disease, but all we accomplish is dilatation of the stricture, which after the cessation of the treatment contracts again. The only possible way to give the patient permanent relief to my mind is, to teach the patient how to introduce the probe himself and let him do it once a week or once in two weeks. Two of my patients who practised this for the past three years have no trouble with the tearing.

Of course this practice has its drawbacks: the patient has to be intelligent, must be able to learn how to use the probe, and we must admit that it is connected with a certain danger, namely self-injury.

No method which aims at forced dilatation of the stricture of the nasal duct, as the stricturotomy or the introduction of a very thick probe, can result in permanent cure. They may produce temporary relief, but after the produced wounds heal, and the scar-tissue contracts, the condition of the patient will surely be worse than it was before.

The same may be said about the probes introduced and left for a certain length of time in the nasal duct. Any number of different probes are recommended, varying in shape and material. The length of time of leaving the probes in the duct differs with the authors, some using them in connection with stricturotomy, others with electrolysis. Hess, Walton, Nicati, Moulton, etc., use metal probes; Thomas uses metal probes and stricturotomy; Jaesche performs a stricturotomy, then introduces first catgut, then a metal probe; Koster uses silk, saturating it daily with nitrate of silver; Guiata uses decalcinated bone, etc. As experience showed, we may have temporary improvement with these methods in some cases, in many, however, not even that can be accomplished. In many cases these permanent probes produce ulcers of the mucous membrane of the duct due to pressure which, instead of improving the condition of the patient, make it worse.

To discard the nasal duct and make a new duct for the tears through the bony wall of the nose is also an operation which has been performed long ago and recommended by various authors in various ways. Celsus, Paul d'Egine, Saint Yves[1] made the new duct through the superior maxillary bone, Langier and recently Foltz[2] opened the orbital wall of the maxillary sinus, Lagrange and Aubaret[3] go through the lachrymal bone. Aubaret[4] in 1905 recommended an operation which consists in the extirpation of the lachrymal sac connected with the resection of the lachrymal bone and a part of the frontal process of the superior maxillary bone.

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[1] *Cit.* Terrien. [2] *Cit.* Terrien. [3] *Soc. franç. d'ophtalm.*, 1907.
[4] *Soc. franç. d'ophtalm.*, 1905.

Hess[1] in 1908 combines the permanent probes with the perforation of the lachrymal bone.

Others tried to restore the permeability of the duct from inside the nose, as Polyak[2] who removes the anterior one-third of the inferior turbinated bone and probes the duct through the nose. Kilian[3] after removing the anterior tip of the inferior turbinated bone introduces a probe into the duct, and then removes the whole inner wall of the lower part of the duct. Passow[4] chisels away intranasally the bony wall of the duct from its inferior opening up to the lachrymal sac and then splits the mucous membrane. These are a few examples of the various and numerous operations recommended for chronic dacryocystitis, all of which, it seems to me, were performed only by the author himself. The uselessness of such operations can easily be seen and understood, if we take into consideration the fact that the nasal mucous membrane has a great tendency to regeneration so that all openings made in the nose close again perfectly within a short time.

Toti in 1904[5] described a new operation, in which, to my mind, he solved the question how to prevent the opening made through the nasal mucous membrane from closing again and with it he solved the punctum saliens of the whole question. That is the impression we get from Toti's so far published results, and from the results of others who, as Schirmer,[6] Elschnig,[7] and Holth,[8] performed the operation. The results obtained in the N. Y. Ophthalmic and Aural Institute correspond with the above mentioned and are also satisfactory.

The brief description of the operation may be given as follows: after chiselling through the bony fossa sacci lacrymalis we resect the internal wall of the lachrymal sac, removing at the same time a part of the nasal mucous membrane, which is of approximately the same size as the remaining external

[1] *Zeitschrift f. Augenh.*, 1908, p. 391.
[2] *Arch. f. Laryngologie*, 1908.
[3] *Laryngol. Operationslehre*, Kafemann.
[4] *Laryngol. Operationslehre*, Kafemann.
[5] *La clinica moderna*, Florence, 1904, N. 35.
[6] *Zeitschr. für Augenheilk.*, 1908, p. 542.
[7] Salus, *Klin. Monatsbl. f. Augenheilk.*, 1909, H. 3.
[8] *Norsk. Mag. f. Laeger*, 1910, N. 2.

wall of the sac. The edges of the two mucous membranes are now brought together into close connection so as to allow their growing together. The mucous membrane of the lachrymal sac takes the place of the removed nasal mucous membrane. Both together form now one continuous mucous membrane and with that the closing of the defect is prevented.

Toti's operation so far has not been published in English, so that I think it will not be a superfluous work to describe its important steps more minutely.

The incision of the skin has the form of an ellipse, its concavity encircling the internal angle of the eye. The length of the incision is about 3–3½*cm* and runs about 3*mm* in front of the anterior extremity of the insertion of the orbicularis. The incision of the subjacent tissues must follow perfectly and everywhere the cutaneous incision and at the same time must be perpendicular to the bony surface. The incision of the periosteum falls also 2–3*mm* anteriorly to the anterior insertion of the tendon. The upper half of the periosteal incision curves upward and outward, at first toward the internal orbital edge, then traversing it, and discontinuing at the union of the superior extremity of the posterior lachrymal crest with the orbital process of the frontal bone. The lower half curves downward and outward until it reaches the inferior edge of the orbit, and stops at about a point corresponding to the anterior projection of the external opening of the bony canal.

The detachment of the periosteum should be made exclusively on the posterior (ocular) side of the periosteal incision. The exterior surface of the rising apophysis and the whole extension of the anterior lachrymal crest is successively detached. On the top, we very often uncover a part of the osseous suture between the internal orbital apophysis of the frontal and the posterior-superior extremity of the rising apophysis of the maxillary bone and the antero-superior of the unguis, up to the superior extremity of the posterior lachrymal crest. Below, we uncover the external surface of the apophysis, furthermore the entire lachrymal crest. Then we detach the periosteum of the entire lachrymal fossa to the base of the posterior lachrymal crest and all around the postero-internal orifice of the nasal canal.

After the detachment of the periosteum, it is advisable to dry rapidly the base of the lachrymal fossa and cover it with an adrenalin 1:1000, and cocain 20:100 tampon. After that follows the cocainization and adrenalization of the nose.

The edges of the bone to be resected correspond entirely to the detachment of the periosteum, that is: we resect first the edge of the orbit at the extension of the fossa sacci lacrymalis, then we resect an oval piece of the bone which is bordered by the crista lacrymalis posterior posteriorly, the ductus naso-lacrymalis inferiorly, and the elongation of the crista lacrymalis posterior superiorly. Care must be taken not to injure the nasal mucous membrane. If the resection is made exactly as described above, we usually find the way directly into the nose. Exceptionally we may find some ethmoidal cells behind the anterior segment of the piece of bone to be resected; we may encounter behind the superior segment some of the inferior frontal cells, or behind the posterior segment some of the lachrymal cells. They may be resected.

Thorsch[1] resected in 82 cases the above mentioned part of the bone and in 65 cases came upon the nasal cavity, in 15 cases he found the way into an ethmoidal cell. In order to avoid the opening of an ethmoidal cell, he states that it is advisable to resect only the anterior part of the fossa sacci lacrymalis (about ¾ of it).

The resection of the internal wall of the lachrymal sac is the next step in the operation and it must be removed in its whole extent.

The resection of the nasal mucous membrane is next in order. The opening in the mucous membrane must correspond in size to the external wall of the lachrymal sac. Before making the opening it is advisable to push the nasal mucous membrane forward through the bony defect, at the same time pushing the flap with the external wall of the sac in the opposite direction, just to see whether or not they can be easily brought together. If there be some difficulty in doing this, we have to enlarge the opening in the bone. To succeed in the resection, the membrane has to be stretched either by introducing the little finger into the nose, or a probe or cotton

[1] *Klin. Monatsbl. f. Augenheilk.*, 47, p. 530.

applicator and then making the excision with a pointed scalpel.

After smoothing off the edges of the bony opening the wound of the skin has to be closed with sutures, taking in as little skin and as much of the underlying tissues as possible. If there be some inflammation in the tissues surrounding the sac, we may let the wound heal by secondary intention. After the completion of the suture, slight pressure bandage has to be applied and, if necessary, the middle turbinated bone removed, but often it is advisable to remove the middle turbinated beforehand. A very important part in the operation is the tamponade of the nose by which we bring and keep in contact the two mucous membranes. For this purpose we use strips of iodoform gauze 2 by 6 to 8*cm*.

After-treatment. The patient must remain quiet, at rest, and not be allowed to blow his nose. If no complication arises, the tampon may be removed on the fourth day. If crusts form in the nose, they have to be removed with a slight tamponade of a few hours' duration, followed by insufflation of sodium borate and sugar of milk powder. If there be some hypersecretion of the nose without formation of crusts, we may use bismuth powder after thoroughly drying the nose.

The external bandage and sutures may be removed on the eighth day.

This is a short description of Toti's operation, which seems to be a well-planned procedure, and, when properly performed, should result in good and permanent drainage of the tears. Of course the drainage is not physiological, as the internal wall of the sac being removed the action of the sac in the conveyance of tears into the nose is eliminated. Nevertheless in successful operations there is none or only very little tearing, the drainage of tears being accomplished, according to Salus, partly through the change in pressure in the nose during inspiration and expiration causing an aspiratory effect upon the tears, partly through the movements and contraction of the muscle elements of the walls of the canaliculi. I think, besides these factors, quite an important part is attributable to the eyelids themselves, which, by closing from the outer corner towards the inner, force the tears into the canaliculus. Once they enter the canaliculus they flow down into the nose,

partly due to the pressure of the following tears, partly due to gravitation.

The operation so far has not received the recognition it deserves. I think this may be greatly attributed to the fact that all similar operations proved to be failures. Besides Toti's publications (39 cases, 23 perfect results, in 16 slight tearing, longest observation 5 years), we find in the literature only Schirmer's report of about 8 cases, out of which 5 resulted in perfect drainage, in 3 cases there was a slight lachrymation, especially outdoors during cold weather. Longest observation nine months. Salus of Elschnig's clinic, Prague, reports on 11 cases. In 6 cases there was no tearing, in 4 cases slight epiphora, and the result equalled an extirpation of the sac in one case. Longest observation three months. Finally, Holth of Christiania comments also favorably on this operation. This article was not accessible to me.

In the New York Ophthalmic and Aural Institute we have performed the operation in 9 cases. All were cases of chronic purulent dacryocystitis of several years' standing. The operation was performed with general narcosis eight times, with local once. The latter case convinced us of the fact emphasized by Toti and Salus that the operation can be performed with properly applied local anæsthesia with hardly any pain. Prior to the operation, the nose was always examined and treated according to the necessity. In all cases the nasal cavity in front of the anterior tip of the middle turbinated bone was entered. The recovery was in all cases by first intention, the small wound healing up within seven to eight days.

In 6 cases we obtained perfect results without tearing; fluorescin dropped into the conjunctival sac appearing in the nose within a short time; in 2 cases there is moderate tearing chiefly outdoors and in hypersecretion of tears due to some irritation, and in one case the result is equal to an extirpation of the sac (no secretion but tearing). This is a case in which the canaliculus was obstructed due to probing. Longest observation nine months.

Shortly summing up our experiences, we conclude that Toti's operation is by far superior to the methods so far used in treating stenosis of the nasal duct and chronic dacryo-

cystitis, and we can highly recommend it to the medical profession. Prior to the operation the permeability of the canaliculi has to be ascertained and the nose put in proper condition. The operation can be performed with local anæsthesia with none or very little pain. In all cases the result is a complete and permanent cessation of secretion and pus, the operation in this respect being equivalent to the extirpation of the sac. In the majority of cases, however, it gives perfect results, restoring the drainage of the tears into the nose completely and permanently, results superior to the extirpation of the sac, or any other procedure so far practised.

THE INDICATIONS FOR OPERATION IN HETEROPHORIA AND SQUINT.[1]

By Dr. ALEXANDER DUANE, New York.

TO set forth clearly the indications for operation in squint and heterophoria we should be prepared to answer the following questions:

Why should we operate at all?

When shall we operate?

How shall we operate?

The answer to the first question will hinge upon our reply to the following:

What are the symptoms for which we operate?

How far can we be sure that such symptoms are due to muscular errors?

How far can we hope permanently to relieve such errors and their resultant symptoms by operation?

What are the direct and the remote dangers and discomforts of the operation and the chances of failure?

What will be the result if we do not operate?

A.—SYMPTOMS DEMANDING OPERATION.

It is obvious that we should not operate unless the patient is suffering or is likely to suffer from more or less serious symptoms. The mere presence of a deviation does not *per se* call for an operation. This is a truism that is sometimes lost sight of.

The symptoms which may be due to muscular errors and which are of sufficient import to call for operation if other measures fail are:

[1] Read before the New England Ophthalmological Society, December 13, 1910.

(1) Disfiguring *squint.*

(2) Pronounced *head-tilting* or actual *torticollis.* Moderate degrees of head-tilting, such as we so often see in patients whom we are examining for glasses, may be due to uncorrected astigmatism. The higher degrees, constituting in some cases a false torticollis, if of ocular origin, are, so far as my experience goes, due rarely, if ever, to refractive errors. Much more often they are caused by a muscular anomaly, especially a paresis of the elevators or depressors. Sometimes the deformity is so pronounced as to call for operation on the eye muscles. A year or more ago I operated on a case of this sort, a young woman in whom a probably congenital paralysis of the inferior rectus had caused a marked torticollis. When the patient's head was straight, there was a vertical squint of 35° with corresponding diplopia. When she laid her head far over on one shoulder in the position that had become habitual to her, the deviation and the diplopia disappeared. The faulty position of the head, the deviation, and the diplopia were all relieved by an advancement of the inferior rectus followed by a tenotomy of the superior rectus.

Less marked cases of this sort are not infrequent. A kind that I have particularly noted is found in infants, who, having a congenital paralysis of the superior rectus, yet fix with the paretic eye so that there is a marked secondary deviation (oblique upshoot) of its fellow. Such children avoid looking toward the side of the eye affected with the paresis, and tilt the head to one shoulder, evidently to obviate the diplopia and confusion caused by the deviation. In such cases tenotomy of the inferior oblique in the eye that shows the upshoot may give excellent results.

(3) *Imperfect fusion power.* While it is probably true that in exercises with the stereoscope and amblyoscope we find our most effective means of training fusion, yet when the deviation is considerable I believe that we do nor secure our best results until the condition is at least partially relieved by operation. For when by operation we get the patient's eyes nearly parallel, the diplopia, which before was so great that he could not overcome it and perhaps could not even recognize it, becomes small and readily superable; and now the intermittent fusion training is supplemented by the

constant involuntary efforts that the patient makes to bring the images together and superimpose them. The two factors, fusion training and operation, may effect in combination what one could not effect alone.

(4) *Diplopia.* Double vision is often a reason for operating. Usually, however, it is not so much for the diplopia itself that we operate as for the secondary symptoms (confusion, vertigo, nausea, etc.) that it causes.

In this regard it must be noted that a diplopia which varies rapidly in amount as the eye shifts from one position of the gaze to another, is much more troublesome than a diplopia which remains nearly constant. I have repeatedly found that an operation which did not abolish the diplopia even in the primary position, but which rendered that diplopia nearly comitant, often markedly relieved the confusion and discomfort from which the patient suffered. On the other hand, any operation which, relieving the diplopia in the primary position, yet tends to produce a diplopia when the eyes are carried away from the primary position, will usually do more harm than good.

Again, a diplopia which even though slight tends to develop and increase as the eyes are carried down is usually a source of considerable trouble. Such trouble may show itself in the form of confusion and vertigo; but, if the deviation and diplopia are very slight and particularly if they are found only in the extreme lower field, the symptom that is most commonly present is asthenopia. In this case the asthenopia has the very characteristic feature that it develops at once when the patient attempts to read, while vision for distance is unattended by trouble of any kind. I have met with a number of these cases, and in a large proportion of them there was a marked and permanent asthenopia, which was often associated with aprosexia and drowsiness. These symptoms begin in early youth and continue unchanged year after year, so that they constitute a very considerable impediment to the patient's intellectual progress. In one such case considerable relief was apparently afforded by an advancement of the inferior rectus.

(5) *Confused vision*, (6) *vertigo*, and (7) *nausea*. In general these are simply evidences of diplopia and especially

of diplopia in which the double images are so close together that they merge and overlap. So confusing is diplopia of this kind that when it is present the patient often unconsciously exerts some manœuvre by which the double images are driven farther apart and thus rendered less disturbing.

As already noted, confusion due to diplopia is much more marked when the diplopia itself is non-comitant, *i. e.*, varies rapidly as the direction of the gaze is shifted.

Confused vision and vertigo may be caused not only by diplopia but also by objects which a patient is trying to sight or to follow with a paretic eye. Such a patient, as is well known, locates objects wrongly, and the more so in proportion as he has to call upon a paretic muscle for aid in looking at them. The net result of this false projection is that, when he does use the paretic muscle to turn the eye, the objects that he sees appear to move, and each at a different rate of speed, depending on its situation. This kaleidoscopic movement gives rise to a peculiarly unpleasant vertigo.[1]

(8) *Pain* in the eyes, (9) *conjunctival irritation*, and (10) *asthenopia*, if of muscular origin, may be the expression either of weakness of the muscles themselves or of an impairment of some co-ordinate movement. The conditions most likely to cause them are convergence insufficiency, insufficiency (especially post-operative) of the interni, and insufficiency (often very slight) of the inferior recti. The last-named condition, as already noted, causes a peculiarly intolerable and persistent asthenopia often associated with *aprosexia* and *drowsiness*.

(11) *Headache* and (12) *reflex disturbances* (remote pains; digestive disorders causing mal-nutrition; tics of various kinds) are sometimes the result of motor anomalies and are sometimes severe enough to call for operation. It not infrequently happens that, when an operation has been done for other causes, the patient tells us that since the operation he has ceased to suffer from headache or from some other trouble, which he had not spoken of before or which had not been attributed to his muscular defect. Again, we sometimes note a marked gain in general well-being and in general

[1] Confusion and vertigo when due to false projection will persist, and when due to diplopia will cease, if the non-paretic eye is shut.

nutrition after an operation—the improvement being attributable to the relief of some persistent reflex strain which had acted to depress the vitality.

True ***migraine*** is often associated with an insufficiency of convergence; sometimes with other muscular anomalies. Whether these are the result of the migraine or of the systemic condition associated with it, or whether they are themselves one of the causes of the migraine, my experience has not prepared me to say. At any rate, I have seen very few cases of migraine in which I thought an operation was indicated.

B.—DIAGNOSTIC POINTS TO BE CONSIDERED BEFORE OPERATING.

To one looking over the foregoing summary of possible indications for operation it is obvious that many of the symptoms described are often due to other causes than muscular anomalies. Sometimes they are due to a multiplicity of causes, of which a muscular anomaly is one. In view of this fact most careful diagnosis and thorough investigation are required before we can decide that an operation is necessary. Such an investigation will seek to determine, first, whether the symptoms are due to a muscular anomaly; second, whether they are likely to be sufficiently severe or sufficiently lasting to warrant interference; third, whether they can be remedied by some means other than operation.

Such an investigation, to be complete, will determine:

1. The precise kind of deviation present and the nature of the underlying pathological condition.
2. The refraction and accommodation of the eye.
3. The presence of troubles in other organs likely to cause reflex symptoms. Such are:
   (*a*) Nasal obstruction and disease of the accessory nasal sinuses.
   (*b*) Hysteria, neurasthenia, or traumatic neurosis.
   (*c*) Conditions of general depression from overwork, worry, convalescence from exhausting diseases, anæmia, etc.
   (*d*) Organic nervous disease, especially disease of syphilitic or tabic origin.
   (*e*) Angiosclerosis and high vascular tension.
   (*f*) Intestinal toxæmia and other metabolic disturbances.
   (*g*) Ovarian and uterine disease.

4. The effect of treatment addressed to the conditions enumerated in (2) and (3), and the effect of treatment other than operative addressed to the relief of the muscular deviation.

It may be well perhaps to take these points up in some detail, since I am persuaded that failure to regard them—failure, in other words, to make a complete diagnosis—is at the bottom of much of our trouble in dealing with muscular anomalies.

1. A complete *diagnosis of the motor anomaly* itself means, first, a precise determination by various tests of the amount and kind of deviation for distance and near; second, a determination of the ability of each eye to perform rotation, and more particularly the ability of both eyes to perform co-ordinate movements (parallel, divergent, and convergent); third, a determination of the amount of diplopia present, the relation, congruous or incongruous, between the diplopia and the objective deviation, and the way in which the diplopia and also the deviation vary in different directions of the gaze. In this last regard special attention should be paid to very slight degrees of diplopia which develop in the extreme lower field, and which are indications of an insufficiency of the depressors and particularly of one or both inferior recti.[1] Such insufficiency may co-exist with orthophoria in the primary position.

These tests will give us our immediate diagnosis, showing that such and such a deviation is present and in such and such an amount. But we should not rest satisfied until we determine the *ultimate diagnosis*, showing the pathological condition underlying the deviation and, if possible, its primary cause. Thus it is not sufficient to ascertain that there is an exophoria or a divergent squint of this or that amount for distance or near. We must ascertain whether the exophoria represents primarily an insufficiency of convergence or a true insufficiency of the interni, or an excess of divergence

[1] A homonymous diplopia which develops only in the extreme lower field may be the expression of an esophoria due to convergence spasm a divergence insufficiency, or an insufficiency of the external rectus. As is well known, homonymous diplopia of whatever origin tends to increase as the eyes are carried down; and if the diplopia is very slight, it may be present only in the lower field.

action which may be combined with normal interni and normal convergence. It may be any of these things separately or in combination, and it may be complicated or exaggerated by defects in the vertically acting muscles. A diagnosis of exophoria alone does not, in fact, carry us very far, particularly as regards treatment. Still more unsatisfactory is a diagnosis of hyperphoria made without a statement of the condition causing it. A hyperphoria, even when minute, is often due to an insufficiency of an elevator or a depressor; when large, it is almost always due to this cause. It makes a good deal of difference as regards symptoms and treatment whether it is due to this cause or not, and, if it is, whether it is an elevator or depressor that is affected. A hyperphoria due to a paresis of an inferior rectus, and which consequently is most manifest when the patient looks down, is much more troublesome than a hyperphoria of perhaps much greater amount due to a paresis of the superior rectus; and it requires altogether different measures for its relief. I have seen several disastrous results produced by the failure of operators to regard this fact.

The *ultimate cause* of the deviation—refractive errors, syphilis, tabes, congenital defects, hysteria, etc.—should be ascertained whenever possible.

Furthermore, especially in the obscurer cases, *repeated examinations* should be made, in order to ascertain if the findings are constant and, when variable, to what the variability is due. Sometimes our second examination fails to confirm the first. Particularly we may find that a diplopia which was apparently significant is no longer in evidence. So, too, moderate degrees of hyperphoria may disappear. Sometimes these changes mean simply that our first examination was wrong. Sometimes these and also more marked variations in the amount of a deviation are the expression of a transient spasmodic action of the muscles, which for the time being produces a deviation or enhances one already present. Variations of more definite character and usually slower in development are produced by treatment (especially correction of the refraction), by alteration in the patient's general condition, and by changes incident to the course of the muscular condition itself (natural progress of a con-

vergent or divergent squint, natural variations in a deviation due to tabes).

Such variations may constitute a bar to operative treatment, as when their marked fluctuations and capricious character indicate that they are accidental and likely to be transient; when they show a tendency toward steady improvement so as to hold out a chance of ultimate recovery without operation; or when they point to the existence of a causal condition (syphilis, tabes, diphtheria) that requires general treatment. On the other hand, the variations may be such as to demand operation early. This is particularly true of those cases of ordinary convergent and divergent squint in which, in spite of a proper correction of the refraction and orthoptic exercises, the deviation shows a tendency to progressive increase, and especially when it is changing from an inconstant and periodic condition to one that is continuous and constant. To wait in such cases until the condition had become inveterate and the muscles permanently weakened would be to invite failure.

These repeated tests may determine us for or against operation, not only by showing us whether the deviation is diminishing or not, but also by showing whether the symptoms are improving or getting worse, and whether or not we are securing a better degree of binocular stereoscopic vision.

2. *Determination of the refraction and accommodation.* The necessity of determining these and correcting any anomaly that may cause symptoms should be obvious to any oculist. In the first place, many deviations are caused directly by refractive errors, and the relief of the latter relieves them too. Again, many of the symptoms that we have enumerated as possibly due to muscular anomalies are much more often due to refractive errors. Hence, when I find a pronounced muscular anomaly in a patient complaining of asthenopia, headache, etc., I first carefully correct the refraction and tell the patient that he has something wrong with his muscles, but that I do not wish to do anything about them until he has worn his glasses a sufficient time to show what they alone will do toward relieving him. The result of this expectant treatment, which according to circumstances may last from six weeks to six months, is that in some cases the deviation itself disap-

pears; in the great majority it persists, but even then frequently the symptoms vanish, so that there is no occasion for further treatment.

Of course there are certain cases in which the muscular condition is obviously causing the main trouble; and if such cases are remediable by operation alone and are causing serious inconvenience, it would be idle to delay. This is particularly true of the congenital cases; also of cases in which the refractive error is already adequately corrected.

3. *Determination of the presence of trouble in other organs.* The above-noted list of conditions which are seated in organs other than the eyes, but which may yet cause symptoms like those of eyestrain, might be extended almost indefinitely. It is sufficient to note here that headache, frontal and occipital, eyeache, and asthenopia are often the result of nasal obstruction, particularly obstruction high up, and of involvement of the accessory nasal sinuses. So often is this the case that, when these symptoms are present, I frequently insist upon a nasal examination, even when no special evidences of nose trouble exist. I do this particularly when there is a convergence insufficiency for which no adequate cause is found; for it has been my experience that convergence insufficiency with troublesome asthenopia often co-exists with nasal obstruction. A very high degree of asthenopia, coupled with all sorts of visual disturbances and the most varied eye and head pains, may occur in hysteria, neurasthenia, and the traumatic neuroses; also in conditions of general depression from overwork and worry; in the convalescence from exhausting diseases or after operation; and in anæmia. The other conditions mentioned (organic nervous disease, intestinal toxæmia and other metabolic disorders, ovarian and uterine disease, angiosclerosis) may also cause obstinate asthenopia and various pains which apparently emanate from the eyes. Such symptoms, it must be remembered, are not necessarily due to eyestrain even when they are brought about directly by use of the eyes. I recall a case of migranoid headache which developed in consequence of reading fine print by a poor light, but which after lasting some days was relieved by cocainization of the turbinates and was permanently helped by intranasal cauterization.

In the presence of eye symptoms which do not yield to ordinary means, such as correction of the refractive error, careful inquiry should be made to determine whether some one of the conditions enumerated may not be the cause of the patient's discomfort. It is particularly important to do this whenever the possibility of an operation is contemplated.

4. ***Determination of the effect of treatment.*** Naturally in order to determine whether any of the conditions mentioned under (2) and (3)—namely errors of refraction and accommodation and morbid conditions of organs other than the eyes—are operating to cause the symptoms of which the patient complains, we have to treat the conditions and, so far as possible, remove them. We thus eliminate one possible cause after another, beginning with the one that is the most likely to produce the symptoms, and finally arrive almost by exclusion at the muscular anomaly as the ***fons et origo mali.***

Even then it by no means follows that an operation is indicated. Orthoptic exercises with amblyoscope, stereoscope, and prisms may relieve the condition or at least hold the symptoms in check; and in some cases the patient's troubles may be got rid of if he wears prismatic glasses. Such ***temporizing treatment,*** then, may enable us to avoid operation altogether. On the other hand, it may itself furnish a direct indication for operating, since if we do find that the patient is helped by prismatic glasses and by orthoptic exercises, we can in general infer that he will be helped still more by a successful operation.[1] We have then only to decide whether the patient is going to derive enough permanent satisfaction from the constant wearing of prismatic glasses or the intermittent use of muscular exercise to enable us to dispense with an operation and with its risks and uncertainties.

In answering this question we must remember that the temporizing treatment with prisms and exercises has very decided limitations. As regards ***orthoptic exercises*** they are serviceable mainly in the young, and in them mainly in conditions of convergence excess and convergence insufficiency. In other cases, their result is dubious, so that while

[1] The converse of this proposition is not universally true. Many cases which are not helped by exercises and by prisms are helped by operation.

they should be tried they should not be tried too long. In fact, we may say in regard to orthoptic exercises that unless they begin to produce results in two months they are not likely to be of any great service. If they do begin to produce results within this time, they should be continued until it is plain that they have reached the limit of their usefulness.

As regards *prisms for constant wear*, my belief is that they are not often of permanent service except in hyperphoria of moderate amount—in which case I have found prisms, base up or down, a valuable aid. Prisms with the base in or out have seemed to me to act in most cases as a temporary help only, and their continued use, I think, often does harm. Moreover, prisms are not of much service in a deviation of any magnitude, nor in a paretic deviation which changes rapidly in amount as the direction of the gaze is shifted. In such cases, we should neither try prisms too long nor be deterred by the fact that they have not afforded relief, but should proceed at once to operation.

(*To be concluded.*)

A CASE OF FLOATING "SOEMMERING'S CRYSTALLINE MASS" IN THE VITREOUS.

(WITH OBSERVATIONS ON THE FORMATION OF LENTICULAR RINGS AFTER EXTRACTION IN THE NEW-BORN ANIMAL.)

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(*With Appended Plate XI., Archiv f. Augenheilk., Vol. LXVI.*)

THE following case seems to me worthy of publication as it presents an ophthalmoscopic picture which, as far as I know, has never before been described.

The patient, 72 years of age, came to the clinic on account of advanced uncomplicated senile cataract in his right emmetropic eye. We are interested only in his left eye, in which the sight was poor since early childhood. At first, he denied any injury to the left eye, but upon closer questioning he remembered that when he was 5 years old his mother stuck a knitting-needle into his eye. There was an escape of water from the eye at the time, but a physician was not called.

The eye is in extreme convergence. Except for a minute macula at the lower-outer corneal margin (which, however, does not give the impression as if it were the result of a perforating wound, and is too small to have been caused by a knitting-needle), there is no evidence of traumatism. The anterior chamber is deep, the iris is tremulous, and there is aphakia. The eye has a myopic build. In the aphakic state, it has a hyperopia of 1 diopter. The fundus shows the changes of high myopia; otherwise it is normal. Vision = fingers at 2 metres.

In the fluid vitreous, beside a few floating opacities, there is seen, in the lower-outer portion, a large ring-shaped mass, of bluish white color, covered with small shiny irregularities of a still more intense white color. It is held in place by a few threads of vitreous only. It floats around rather freely, so that the observer sees it from different sides, making it certain that the hole in the ring is empty and not occupied by a membrane.

Fig. 1 (Plate XI.) gives us only an approximate idea of the condition. The position of the eye (turned downward and outward) is indicated by the obliquity of the pupil, and the ring is drawn smaller than it really is, to indicate the perspective, as its diameter equals or even slightly exceeds that of the dilated pupil.

However, even from the drawing, we can see that we have to deal with the remains of the lens, *i. e.*, with a "Soemmering's crystalline mass" floating around in the vitreous. The question is, how do we explain its presence here?

There are two possibilities:

Either, as the result of the injury with the knitting-needle, there occurred a traumatic cataract, and the lens became absorbed, leaving, behind, a crystalline mass, which, later, as the result of increasing myopia and spontaneous absorption of the zonula, became displaced, as we know to occur sometimes with the intact lens.

On the other hand, the eye may have been very highly myopic from earliest childhood, and the lens may have been luxated in its capsule into the vitreous as the result of blunt traumatism, and may have been absorbed there, leaving the crystalline mass. In this case, we must assume that the capsule was ruptured during the dislocation. The latter seems to me the more probable theory, as it seems harder to imagine that so light a structure as the crystalline mass could become dislocated with fluidification of the vitreous and destruction of the zonula, whereas in the case of the intact lens this is much more probable. In either case, however, we have a very unusual condition, as even the fate of a lens dislocated in its capsule into the vitreous is, as we know, usually a different one.

Of the occurrence of the crystalline mass, there have appeared, since the description by Soemmering, in 1828, and

even before that, so many anatomical and experimental treatises, that there remains very little to add to the subject. It is certain that it is the result, partly of degenerative products of remnants of the lens, and partly of a regenerative process—that is, hypertrophies of the capsular epithelium. The deciding factor is, how much of the nuclear zone remained behind, after the extraction? This was determined by Gonin, in his experimental studies on the guinea-pig, as here the lens is usually only partially removed. He found, as the result of these partial extractions, relatively large disk-shaped, semilunar, or ring-shaped lenticular masses. When he says, however, that the age of the animal has no bearing on the extent of the regeneration (or rather pseudo-regeneration), it is because he operated almost entirely on full-grown guinea-pigs. The youngest of his animals was six weeks old.

I would, therefore, like to publish here a few observations which I made on the eyes of new-born guinea-pigs, in regard to experiments to determine the influence of extraction on the growth of the eye. An operative method was chosen which would necessitate the least amount of traumatism for these small eyes, namely, discission of the lens-capsule with the needle, followed by linear extraction of the opaque and swollen lens masses. As far as the results upon the growth of the eye are concerned, I will mention those at another time. Here we are interested only in the regenerative changes, which are illustrated in the following characteristic case.

The lens was removed in the above-described manner from a ten-day-old guinea-pig. The pupil became black immediately and remained black, so that, as far as the optical effect is concerned, the lens was entirely removed. There was no after-cataract. Two months later, when I killed the animal in order to enucleate the eye, on ophthalmoscopic examination—the eye appeared aphakic, and had a hyperopia of about 11 diopters.

When the globe was divided equatorially, there was seen, behind the iris, in the fresh state, an almost clear lenticular ring, of a size and shape as shown in Fig. 2 (Plate XI.), enlarged 2½ times. This mass is larger and more regular

in shape than the structures described by Gonin, and the result of the microscopic examination is very remarkable. This examination showed (compare Fig. 3, Plate XI.) that the lens capsule has enclosed the ring on all sides, in such a way that there is capsular epithelium only on its anterior surface, to which there is attached, not only on the inner but also on the outer circumference of the ring, an almost completely regular nuclear bow. This results in a picture, on meridional section, as if there lay, on either side, behind the iris, a separate lens, with its usual arrangement of fibres. The space between the two masses is bridged in by hyaloid membrane.

We have, therefore, before us, a process which, even in the form of a lenticular ring, is trying to imitate, as far as possible, the architecture of the normal lens. That we are not dealing with a real degeneration, but with a regeneration through growth, is evident. The starting-point was undoubtedly the remains of the nuclear zone of the originally very small lens, which was left in spite of extensive discission and evacuation. In the formation of an inner nuclear zone, there is undoubtedly a real new formation of the lenticular architecture, which extends beyond the analogous occurrences in the formation of the crystalline mass.

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THE ACTION OF 606 UPON THE EYE.

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Translated from the *Arch. f. Augenheilk.*, the German Edition of these Archives, Vol. LXVIII., 1911, by Adolph O. Pfingst, M.D., Louisville, Ky.

ALTHOUGH but a short time has elapsed since Prof. Ehrlich introduced the arseno-benzol treatment for syphilis known as 606, brilliant results have been reported following its use.

Among the cases recorded may be found quite a number in which the syphilitic process involved the eyes, but with few exceptions they were included in general reports. A few have been reported by ophthalmologists.

As a basis of my report I have the histories of 180 cases of syphilis of the eye treated in the clinic of Prof. Greeff in which arseno-benzol was administered. A comparative study of these cases and those taken from the general literature will prove interesting.

In the choice of the method of administration of the arseno-benzol in my cases no special mode of administration was adhered to in exclusion of the others, as each seems to offer some advantages.

The intravenous method of injection is believed to offer the advantage of more rapid action and hence it was employed in a small percentage of the cases. However, most of the injections were made subcutaneously with the alkaline solution, as it appealed to me as the most rational method for the average case and for the average practitioner. The solution is sterile, easily and rapidly prepared, is readily applied without the need of an assistant, and, as far as present literature shows, is never followed by undesirable results.

The neutral suspension and acid solution were not resorted

to in my cases as a number of unfavorable results have been reported by Geronne (1), Hoffman, Grouven (2), and others in which considerable reaction, necrosis, and other undesirable complications were noted. Even after the intravenous injections of the drug some untoward symptoms and unfavorable physical conditions have been reported, Geronne having observed chills, nausea, vomiting, and diarrhœa following its employment. He also reports one case of thrombosis and another in which the patient collapsed following the injection. Others have reported necrosis following the intravenous method. An additional unfavorable feature of this method is the time consumed in the manufacture of the preparation and its application. When the veins are found with difficulty, as sometimes happens, over a half hour is consumed in the manufacture of the preparation and its injection. After all, the results obtained by the intravenous method are not much more rapid than by the other methods [Kromayer (3)]. It has been pointed out in favor of the intravenous injection that it is absolutely painless and that the drug is more rapidly eliminated from the body, which would make it serviceable and safe for clinical use.

The cases of this series were kept under observation for a varying length of time. All of them were subjected to the Wassermann test. Although but four months had elapsed since the last cases were treated with 606 the test remained positive in only a small percentage of patients. On the other hand, several cases presented all of the clinical and therapeutic evidences of syphilis, notwithstanding the negative Wassermann test. These observations lead to the conclusion that the Wassermann test is of value only when the result is positive, thereby corroborating the clinical diagnosis, while the negative result has no significance.

The dose of arseno-benzol employed in our cases varied for adults from 0.3 to 0.7 gramme. In children 0.08 gramme was given for every kilogramme of body-weight.

In a general way it might be said that the injections nearly always resulted in increase in the patient's weight and in improvement of vision. Necrosis of the skin, jaundice, intestinal colic, and other symptoms of arsenical poisoning

reported by others were never seen, nor were the brilliant results of the treatment as observed by others ever noted in these cases. In fact the results of the treatment, with but a few exceptions, were no more pronounced than those obtained by the recognized antisyphilitic therapeutic measures. It was not infrequently noticed that subjective symptoms, such as the headache associated with choked disk, the pain of iritis, the irritation in keratitis, and the lancinating pains in tabes disappeared rapidly after the 606 treatment, although the physical conditions did not change more rapidly than they do under mercurial and iodin treatment. The arseno-benzol seemed to have a selective action, relieving symptoms without exerting sufficient influence on the pathological conditions present to correct them. To illustrate, a case of gumma of the ciliary body might be mentioned in which rupture of the sclera seemed imminent and which responded so well to the calomel injections that the ectasia subsided, the posterior synechia lessened, and the vision improved, yet the eye remained very irritable and sensitive to light. After one injection of 0.5 gramme of arseno-benzol these subjective symptoms disappeared, though no further improvement in the physical condition took place. To illustrate that this rule is not constant and that neither local changes nor subjective improvements may follow the use of the new treatment, I would briefly cite the following case of interstitial keratitis.

A man of 26 years developed parenchymatous keratitis while under mercurial treatment by inunction for a polyarthritis. After three months the cornea had almost entirely cleared and the case had become negative to the Wassermann test. Soon after this the right eye developed a parenchymatous inflammation. The Ehrlich 606 was administered, but instead of being followed by improvement the eye grew worse. This case was finally cleared up by tuberculin injections. Uhthoff (4) has also reported a case of interstitial keratitis which did not respond to the arseno-benzol injections. Schanz (5), on the other hand, reports a more rapid result following the new treatment than he had ever experienced before in cases of this kind treated by other means. Sehligsohn (6) also reported a case of interstitial keratitis in which

he claims rapid results from the arseno-benzol, but as the history of the case shows that the patient could count only fingers at fifteen feet six weeks after the injection the result could hardly be looked upon as a brilliant one. Best (7) and others also report disappointing results in the treatment of parenchymatous corneal disease with the new treatment.

My report includes 12 cases of interstitial keratitis in none of which the cornea had returned to normal four months after the Ehrlich treatment. It would seem that the deep corneal opacity of an interstitial disease in which the presence of the spirochætæ has been demonstrated [Clausen (8)] would almost certainly clear up after the administration of a remedy for which a specific action is claimed, if, as is believed by some, the opacity is the result of the parasitic action.

In a number of cases of specific keratitis in children I was able to notice considerable improvement following injections of 606, a rapid lessening of the inflammation being apparent. In other cases the treatment made no impression whatever upon the course of the disease.

In the treatment of iritis more encouraging results can be reported. In one acute case the immediate effect of an injection of 0.5 gramme of the remedy was a relapse, which, however, was followed in several days by rapid subsidence of the inflammation and return to almost normal condition in two weeks. In a chronic case of iritis with seclusion and occlusion of the pupil, resorption of the deposit on the anterior lens capsule followed the arseno-benzol injection and synechiæ were loosened so that the vision was raised from $\frac{1}{20}$ to $\frac{5}{10}$ in one eye and to $\frac{5}{7}$ in the other. It is worthy of note that a luetic condition of the feet of this patient failed to improve after the injection.

Prompt results of the new treatment can also be reported in the specific opacities of the vitreous. In one of these cases the vision increased from $\frac{5}{50}$ to $\frac{5}{10}$ and from $\frac{5}{20}$ to $\frac{5}{7}$ in the right and left eye respectively. Strangely we note again in this case the failure of other conditions to respond to the treatment, the optic neuritis and circumcorneal injection remaining unchanged even after a second injection.

In the single case of sympathetic ophthalmia subjected to the arsenic treatment, no improvement resulted and the

offending eye had to be enucleated. In one case of choked disk a remarkable result was obtained, as normal conditions of the nerve head were noted two weeks after the treatment. Michaelis (9) also reported a case of cerebral gumma with choked disk in which the Ehrlich injection was followed by satisfactory results. In syphilitic endarteritis of the eye, my results were as discouraging as Oppenheimer's (10), the vision growing worse after the injection. Hirsch (11) noted an improvement in the appearance of the blood-vessels in cases of this kind, but failed to make out improvement in function.

In my cases of paralysis of the extrinsic ocular muscles permanent results were not obtained—a very brief period of binocular vision being the only improvement noted in any of these cases. Negative results were also obtained from the treatment in cases of optic-nerve atrophy and disturbances of pupillary action. It should be stated that ill effects upon the nerve, as were formerly found by von Grosz (12), were never seen, and with von Grosz I cannot see in a nerve atrophy a contra-indication to the use of arseno-benzol.

Among the many authors who have published their results with the Ehrlich-Hata treatment, Buschke was the first to report specific cases illustrating the ill effect of the treatment. He observed a case of peroneus paralysis following its use, and his pupil Fischer (13) reported inequality of the pupils in one case. This led them to the belief that the arseno-benzol is a nerve poison.

Having made a careful study of the pupils before and after treatment with 606, in my cases I can report inequality of the pupils in ten of the patients in whom the eyes were otherwise normal. In three of these cases the pupils were unequal before the injection and in seven it came on soon after the administration. From this observation the deduction may be drawn that inequality of the pupils is a secondary symptom of the syphilitic infection, and that the early appearance of this symptom after the arseno-benzol treatment can be accounted for in a local reaction brought about in diseased structures by the therapeutic agent. Yet the number of cases in which inequality of the pupils was seen is striking, as heretofore anisocoria was observed only in cases of meta-syphilis. However, the failure to observe this difference in

pupillary size may have merely been an oversight, as patients are infrequently examined with reference to this phenomenon. In order to exclude the possibility of an error in my cases, only such are included in which the measurements were corroborated by others connected with the clinic.

The cases of facial paresis reported by Spithoff (14), in which the symptoms appeared 8 weeks after an injection of 0.45 gramme, and the one of Kowalewski (15), in which the optic neuritis occurred 2 months after the injection, can in all likelihood be regarded as results of syphilis rather than of the treatment. The same is probably true of the cases of extensive ophthalmoplegia and optic neuritis reported by Wechselman (16), Riebe (17), and others. In the opinion of Ridle, Buschke, and others, the syphilitic poison and the therapeutic agent are both factors in the production of these conditions. As evidence of the action of arseno-benzol, they point out cases with a negative Wassermann test in which the arseno-benzol treatment was followed by nerve involvement. Furthermore, they believe that the unilateral appearance of the choked disk is significant, because this condition, resulting from luetic involvement of the brain and its membranes, is nearly always present in both eyes. On the other hand, unilateral eye affections would ordinarily point more to a syphilitic origin, as toxic eye conditions resulting from atoxyl, alcohol, nicotine, etc., almost without exception involve both eyes.

Of the 180 cases of my series, relapses were noted eight times. One patient developed iritis in a previously healthy eye eight days after the 606 injection, and another an optic neuritis six weeks after the injection. In the latter case there was a history of genital ulcers coming on four months after the primary infection. An injection of 0.45 gramme of arseno-benzol was given and in three weeks every symptom had disappeared. A month later she applied at the eye clinic and showed a marked reduction of vision to $\frac{5}{20}$, a choked disk having developed.

Relapses in syphilitic patients who have been subjected to the arseno-benzol treatment seem especially prone to involve the eyes (18) and the cranial nerves (19). While this action has been attributed to the arsenic preparation,

it is probable that the attention attracted to the eyes by virtue of their frequent involvement in other toxæmias has led to erroneous conclusions in this regard. It is a question whether relapses are really more frequent after the use of 606 than they are after mercurial treatment of syphilis. We must recall that formerly syphilis was not considered cured until after lengthy mercurial treatment, and that symptoms attributable to the syphilis occurring during that time were not classed as relapses. Contrary to this, the cases of lues treated with 606 were considered cured soon after the injection, so that all symptoms of syphilis occurring subsequently were classed as relapses.

In a comparative way the results of former syphilitic treatment would be of interest. According to Bruhns (20), from 20 to 25 of all syphilitics die of involvement of the nervous system or the circulatory system notwithstanding the proper application of antisyphilitic therapeutic agents. In such cases in which incomplete treatment was given only 25 per cent. of cases remained free of symptoms as long as three months, while a little more than 50 per cent. of the cases showed symptoms in the first two months, and one fourth showed evidence of the disease in the first month.

Michaelis (21) reports 29 per cent. of relapses in the first three months following the Ehrlich treatment. Schreiber had better results with the intravenous injections, reporting one relapse in 650 cases. It might be stated that in a number of his cases the injection had to be repeated.

To sum up, we can say that in 606 we have an effective treatment for syphilitic diseases of the eyes in which a rapid result is essential or when the cases have failed to respond to mercurial or iodine treatment. It can not be looked upon, at least not in eye diseases, as a panacea for all cases of syphilis which will supplant our present specific therapeutic agents for that disease. The ill effects attributed to the treatment by some could not be borne out by this report. Such adverse conditions as were observed were accredited to the lues itself rather than to the new treatment.

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EHRLICH-HATA 606 IN OPHTHALMOLOGY.

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Translated from the *Archiv f. Augenhlk.*, the German Edition of These Archives, Vol. LXVIII., 1911, by Dr. Adolph O. Pfingst, Louisville, Ky.

A BRIEF report of 21 cases of syphilitic eye affections treated with arseno-benzol injections may be of interest at this time when so many cases of all forms of syphilis are going on record.

The cases in this report were, with a single exception, treated by the intragluteal injections of the neutral emulsion. In the one other case the drug was administered subcutaneously between the scapulæ. Not a single serious complication followed the injections, though transitory symptoms were not uncommon. In most of the patients an infiltration was observed around the point of the puncture; in 5 cases a slight rise in temperature and in one case severe sciatica of three days' duration followed the injection. A patient with spinal syphilis suffered for several days with lancinating pains in the right arm, extending to the hand after an injection of 0.5 gramme of the drug into the gluteal muscles. One patient complained of mental hebetude for two days after the injection. Cases of optic-nerve atrophy were not included in this series, not because of any fear of the ill effects of the drug, but rather on account of my scepticisms of its beneficial action in a real degenerative process. In a review of 900 cases of syphilis, only 6 cases of acute or subacute optic neuritis were found. In each case the condition was bilateral.

The Ehrlich-Hata treatment has not stood the test of time, so that a positive conclusion as to its value can not as yet be arrived at. The clinical test is made difficult on account of the severity of the disease, the frequent seat of the inflam-

matory process in parts not easily accessible to the drug (cornea), and above all to the difference in the degree of absorption at different parts of the body. The observation that the rapidity of absorption and the therapeutic effect are in direct relation to each other could easily be made.

A brief résumé of my cases follows:

CASE 1.—*Specific iritis* in male of 26 years. Wassermann positive. Acute symptoms had abated when first seen. The anterior chamber was still cloudy, the lower portion of the posterior corneal surface was covered with minute yellowish deposits, and two small posterior synechiæ were visible. On the day of admission 0.5 gramme of Ehrlich-Hata was given. Four days later there was considerable circumcorneal injection, and a few new delicate synechiæ had formed, but the deposits on the cornea were clearing, some having become confluent. Some improvement in the photophobia and lachrymation was noted. By the end of a week the right eye had returned to normal. In the five days following this the physical condition remained unaltered, a period of inactivity having set in. A second injection of 0.5 gramme was given which was quickly followed by marked improvement. Three weeks after the second injection the anterior chamber was clear, the swelling in the iris reduced, but still covered with a delicate yellowish deposit.

CASE 2.—Male, aged 50; *kerato-iritis* of left eye of four weeks' duration; vision reduced to fingers at 20*cm*. There was marked injection, the cornea was hazy, the pupil was narrow, and the iris adherent. Wassermann negative. The patient was given an injection of 0.5 gramme of the arsenobenzol. In three days the cornea had entirely cleared. The iris was still adherent, but was not discolored. Vision $\frac{4}{10}$. On the 29th day, after all symptoms of disease of the cornea and iris had disappeared, an intercurrent neuritis of the optic nerve developed. The uveal tract responded in this case more readily to the Ehrlich treatment than to mercurials. This patient escaped our further observation, but he evidently had not been given sufficient of the drug to entirely eradicate the disease.

CASE 3.—*Acute iritis.* Inflammation of the right eye of eight days' standing. Marked ciliary injection, irregular pupil with marked synechia, a vascular papillary swelling of the iris, cloudy anterior chamber. The patient suffered considerable pain. Vision had been reduced to movements of hand at 2½ metres. He was given 0.5 gramme of the Ehrlich-Hata, which was followed by a marked reaction:

the ciliary injection becoming more pronounced, the opacity of the aqueous humor increasing, the papillary enlargement taking on a coppery cast, and the pains becoming severe. Two days later the reaction subsided and in 6 days a yellowish discolored area marked the point of the papillary enlargement; the cornea and humors were normal, also the fundus. Vision $\frac{1}{20}$. This case was featured by the large papillary swelling at the pupillary edge of the iris, which disappeared in six days following the Ehrlich-Hata injection.

CASE 4. Male, 32 years old, with a history of a syphilitic infection six months previously; had a marked *optic neuritis* on the right side, and the condition beginning on the left. Wassermann positive. An injection of 0.5 gramme of arseno-benzol was given. It took the nerve of the left eye thirty days to return to normal and the right one two and one half months. Mercurial treatment by inunction and injection previous to the employment of the Ehrlich-Hata treatment seemed to have no prophylactic influence upon the disease. However, we know that in cases of descending neuritis of basilar origin the effect of mercurial treatment is questionable.

CASE 5. Male, aged 24. *Optic neuritis.* Both optic disks slightly obscured, edges blurred, veins distended and tortuous. Wassermann positive. Vision normal. Injection of 0.5 gramme of Ehrlich-Hata, with return to normal in five days.

CASE 6. Male, aged 24 years. Right, beginning *papillitis;* left, pronounced, with vision $\frac{1}{4}$. Wassermann positive. Ehrlich-Hata injection of 0.5 gramme with improvement in three days. As the improvement did not continue, a second injection was given two weeks after the first one, which was followed by improvement and a return to normal in thirty-seven days after the first dose.

CASE 7. Female, 32 years. A double well marked *papillo-retinitis* without disturbance of vision. Wassermann positive. Injection of 0.2 gramme of arseno-benzol. In two days decided changes had taken place, the swelling having lessened and the stasis having become less marked. In this case the improvement was also not continuous, necessitating a second injection (0.5*grm.*) seven weeks after the first. Three weeks later the papillæ had assumed their normal appearance.

CASE 8. Female aged 40 years. Beginning *papillitis* of both eyes with normal vision. Positive Wassermann. Return to normal six days after an injection of 0.5 gramme of Ehrlich-Hata.

CASE 9. Male, aged 31 years. Double *optic neuritis*

following syphilitic infection eleven years previously and an indefinite mercurial treatment. Wassermann positive. Vision, right eye, $\frac{5}{15}$; left, movements of hand at three feet, and left eye showing a marked central scotoma. Eight days after an injection of 0.5 gramme of arseno-benzol function of the right eye had returned to normal. A second injection of the same amount was necessary to bring about normal conditions in the left eye in thirty-two days.

CASES 11 and 12 were old cases respectively of *optic neuritis*, with resulting pallor of the temporal half of the disks, of central chorio-retinitis and of specific retinitis with annular scotoma, in all of which the Wassermann test was positive and in which the Ehrlich-Hata injection was merely given as a prophylactic measure.

CASE 13. A female, aged 45, had a luetic *tarsitis* of several months' duration with positive Wassermann test. An injection of 0.5 gramme of Ehrlich-Hata was followed by pronounced improvement and return to normal in six days.

CASE 14. Male, aged 35 years. Spinal lues with ataxia and *paresis of the left superior oblique muscle.* The ocular paresis was cured in six weeks by injections of 0.5 gramme of Ehrlich-Hata and the diplopia several days later. The tabes was also improved so that the patient regained the use of his legs.

CASE 15. Male, aged 54 years. *Tabes dorsalis*, marked ataxia, gastric disturbance, diarrhœa, lancinating pains, anæmia, etc. Wassermann positive. The pupillary reflex on the right side was entirely lost and on the left partially disturbed. Vision was normal and there was no optic atrophy. The Ehrlich-Hata treatment in this case, though given as a prophylactic against optic atrophy, was followed by almost marvellous improvement in the general condition of the patient.

CASE 16. Marked *atrophy* of the left *optic nerve*, reduced vision, and constricted field of vision in a typical case of tabes, with positive Wassermann reaction; was injected with 0.5 gramme of Ehrlich-Hata, but so recently that results could not be reported.

CASES 17, 18, 19, and 20 were all cases of pronounced *parenchymatous keratitis* involving both eyes. The patients all had the usual symptoms found in inherited lues and all responded positively to the Wassermann test. In the first of these cases the injection was given when the right cornea was completely clouded and vision was reduced to fingers at a half foot while the other eye was not involved. An injection of 0.2*grm* of Ehrlich-Hata was promptly followed by improvement and a return of function to

$\frac{5}{50}$ in two days and by a complete restoration of normal physical conditions and normal functions in 59 days. With the improvement of the right eye there was a corresponding involvement of the left one in which the vision was reduced to $\frac{2}{50}$ on the fifty-ninth day after the injection. A second dose of 0.2*grm* was followed by improvement of this eye.

In the second case the function of the right eye was reduced to fingers at six feet, and on the left at one and one-half feet. The Ehrlich-Hata injection instead of improving conditions rather made them worse. This case was finally cured by mercurial inunctions.

In the third case the injection was made when the vision on the right side was reduced to fingers at 20*cm* and the left cornea was just beginning to cloud. A previous ineffectual mercurial treatment had been given. No appreciable effect was obtained after one injection of arseno-benzol, but after a second dose the improvement was quite marked and the cornea cleared with the exception of some permanent maculæ.

In the fourth case the disease had advanced in the right cornea and was beginning in the left. The patient could count fingers at about seven feet with the right eye and had $\frac{5}{35}$ vision in the left. The first injection of 0.5 gramme of arseno-benzol was followed by little or no improvement. A second injection was given three weeks later, which was followed by prompt and lasting improvement.

The cornea seems to be one of the most difficult parts of the body for the antisyphilitic treatment to reach, principally on account of the indirect blood supply of the cornea.

One pronounced feature of all the cases of parenchymatous keratitis was the gradual improvement of one eye after the treatment, and the coincident involvement of the second eye.

Although these few observations are not intended to be conclusive either for or against the new method of treating syphilis, the report adds interesting cases to our literature. The one case of the series in which the treatment failed entirely does not offset the others in which results were uniformly good. The remarkable therapeutic action of the drug in removing a large papillary swelling of the iris in a week and curing a tarsitis of several months' duration in two days seems to be convincing, even to the skeptical, and we probably have in arseno-benzol a most important addition to ophthalmic therapeutics.

REPORT OF THE PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By C. DEVEREUX MARSHALL, F.R.C.S.

An ordinary meeting of the Society was held at the Medical Society's Rooms, Chandos Street, London, on Thursday, January 26, 1911. Dr. G. A. BERRY, President, in the Chair.

Before proceeding to the agenda, Dr. THOMAS BUZZARD was elected, by ballot, an Honorary Member of the Society.

Mr. E. A. DORRELL showed a drawing of **unusual appearances of the iris in congenital syphilis;** also a **paracentesis needle** for use in preparing vaccines from the aqueous.

Mr. R. R. JAMES exhibited a case of **pedunculated tumor of the conjunctiva,** Dr. ANGUS MCNAB showed a case of **false projection;** and Mr. HOSFORD brought forward six cases illustrating **congenital dislocation of the lens.**

Mr. J. HERBERT FISHER read a paper entitled **the pituitary body and lesions of the optic chiasma.** After alluding to cases which from time to time had sporadically been reported in the Transactions of the Society, Mr. Fisher dealt shortly with the development, structural anatomy, and function of the hypophysis cerebri. Reference was made to the recognition and elucidation of acromegaly by Marie, in 1886 and subsequent years, and Fröhlich's train of symptoms known as "Dystrophia adiposo-genitalis" was sketched. Recent experimental work on the pituitary body and its function by Pavlesco and Harvey Cushing was narrated. The association between the hypophysis cerebri and other ductless glands was reviewed. Cushing deduced from his extensive work on the subject that acromegaly and gigantism were the result of hypersecretion of the anterior lobe of the pituitary gland, while Fröhlich's train of symptoms was the result of

hyposecretion. Mixed cases were explained on this theory. The author then detailed nine cases of pituitary body and chiasma lesion which he had personally observed, over a long period of time in most instances. The cases provided examples of acromegaly and of Fröhlich's syndrome in complete and in partial manifestations; one complete case showed that this train of symptoms might develop in the adult as well as in the child. The cases showed the early liability to sexual disturbance and impotence in pituitary body lesions. Primary atrophy, not papillo-œdema, was the ophthalmoscopic phenomenon in all the cases. Some examples of very practical benefit by treatment with thyroid extract or pituitary extract were afforded. In the later cases, special extract of the anterior pituitary lobe only was being tried, with some encouraging signs of benefit. In every case charts of the field of vision were exhibited, and the necessity of perimetry for the diagnosis was insisted on. The additional value of X-rays in demonstrating enlargement and destruction of the sella turcica was well exemplified by the skiagrams of the patients.

The PRESIDENT, in initiating the discussion on the paper, invited members to narrate any experience they might have had of such cases, and particularly if they had had any in which treatment had been beneficial; there were probably many who had seen cases of bi-temporal hemianopia due to acromegaly. An interesting point was as to the proportion of cases of acromegaly in which eye symptoms were present. Did the cases showing bi-temporal hemianopia begin with changes in the pituitary body, or were they cases in which owing to changes subsequently taking place in the sella turcica there were pressure effects on the decussating fibres which ran to the ventral surface of the chiasma? Mr. J. B. LAWFORD said he had reported a case very similar to those of Mr. Fisher. The patient was a man aged 36, and was under observation 21 months. He came with his left eye nearly blind, there having been a history of progressive loss of sight on that side. The vision in the right eye at that time was $\frac{6}{12}$. He was a thin man but healthy-looking, and the loss of sight was his only complaint. There was no definite history of syphilis, although he had a sore on the penis seven

years previously, but without secondary symptoms. Smell, the fifth nerve, and other senses were normal; there was no headache, no sexual incapacity, and no signs of tabes. There was optic atrophy well-marked in the left eye, and pallor of the right disk. On account of the history of a chancre, he was put on antisyphilitic treatment for a short time, but no improvement occurred, and three months later he had thyroid treatment. At that date the vision in the good eye had been reduced from $\frac{6}{12}$ to $\frac{6}{24}$ and 18 J., and he had lost a large part of the temporal field in the right eye. After treatment by thyroid, the central vision rose from $\frac{6}{24}$ to $\frac{6}{6}$ and from 18 J. to 1 J. X-ray examination of the base of the skull was negative. Later there was failure of sight, and he was again taken into hospital and put on pituitary extract alternating with thyroid extract; he did not then know of the special anterior lobe extract. The vision steadily failed, and when last seen that of the right eye had fallen to perception of hand movements. The man remained free from other symptoms of disease. Mr. R. W. DOYNE expressed regret that Mr. Fisher did not ascertain the field for color in those cases. In some cases showing hemianopic loss there was a normal white field. Ten or twelve years ago he published particulars of one case of acromegaly in which the field for white light was normal, but the whole of the upper sector was lost for color. In that case, which went from bad to worse, he could tell beforehand how it was going by the loss of color which occurred first. Mr. JAMESON EVANS narrated the case of a patient who suffered from hemianopia but no other symptom. That went on for ten years, and then he developed some other symptoms, which led to an operation for pituitary growth, but it was not successful. He thought that in some of the cases cryptorchism was present. He treated one case with thyroid extract, and it lost weight. Pituitary extract resulted only in an increased secretion of urine. Cases of acromegaly seemed to do well on mixed treatment by thyroid extract and pituitary extract. Mr. RICHARDSON CROSS said the cases seen were those in which there was pressure on the chiasma. He had a young woman in whom the menstrual function was very imperfect, and whose mental attitude was unsatisfactory. He operated

upon her for squint, and she had typical symptoms of acromegaly. She had been treated unsuccessfully with thyroid extract and pituitary extract, and he showed charts of the fields of vision. He also showed some charts of a patient who had pressure on the chiasma, but in whom there was no acromegaly. Mr. HEWKLEY asked whether there was hyperæsthesia of the remaining sentient portion of the retina. In one case when the person passed by a street lamp in a suburb the light would apparently be very dazzling to his eyes. Mr. Fisher replied that the cases which he had reported were not acromegalic, with the exception of the first one. He felt sure that in many instances there was enlargement or growth in the region of, if not developing in, the pituitary body and pressing on the chiasma. He regretted he did not investigate the color fields, owing to the stress of out-patient work. But he would hesitate to accept Mr. Doyne's observations that early contraction or loss of the temporal portion of the field for color must be an inevitable guide for prognosis, though if that were so it would be a great guide to the future.

An ordinary meeting of the Society was held at the Medical Society's Rooms, on Thursday, February 9, 1911, under the chairmanship of Mr. GUSTAVUS HARTRIDGE, Vice-President.

Mr. BREWERTON showed a case of **symmetrical marginal corneal degeneration**, and Mr. GRIMSDALE a patient with **irideremia and deformity of lens**. Mr. HIGGENS showed a patient on whom he performed his **operations of dacryo-cysto-rhinostomy**, and described the procedure. The CHAIRMAN and Dr. HILL GRIFFITH discussed the case. Mr. TREACHER COLLINS exhibited a case of **wide-spread exudation internal to the choroid and beneath the retinal vessels,** giving rise to a white reflex. Mr. HEPBURN, in discussing the case, said he thought the condition as now seen was old and quiescent. He did not regard the changes as an exudate, but as an extensive fibrous-tissue development, the result of an exudate which had occurred earlier. The changes involved the choroid as well as the retina. He stated in detail the reasons for his opinion. Mr. G. COATS agreed with Mr. Collins that the condition was due to subretinal hemorrhage, commencing in the deepest layer of the retina, and breaking into the

subretinal space, with subsequent organization. Mr. COLLINS replied that he did not suggest it was now an active exudate. Mr. R. R. CRUISE showed a case of **central retinal detachment**, probably tubercular.

A paper by Mr. LESLIE PATON and Dr. GORDON HOLMES was read by the former on **histo-pathology of papillo-œdema**. It was a preliminary account of their investigations into the pathology of papillo-œdema. Their work was based on the histological examination of 60 eyes, all from cases in the National Hospital for the Paralyzed and Epileptic, Queen Square. The conclusions they formed from these cases were that the so-called "optic neuritis" was a simple congestive œdema of the disk, and was not in any way an inflammatory phenomenon. Inflammation when it did occur was slight in amount, limited in its distribution, and secondary in its nature. The hemorrhages that occurred were in the main congestive, but partly due to stretching and rupture of small vessels by the swelling disk. The larger white patches that occurred on or near the disk were due to degeneration of the nerve fibres. This degeneration showed itself first by varicosities appearing on the nerve fibres, which later swelled up into elliptical or globular bodies known as "cytoid bodies." These might lose their connection with the nerve fibre from which they developed, and consequently undergo fatty degeneration. The smaller bright-white spots arranged in fan-shaped fashion between the disk and macula were due to œdema raising the membrana limitans interna into vesicles. The changes produced as the disk became atrophic were (*a*) occlusion of the smaller vessels by endothelial proliferation and adventitial thickening in the walls of the larger vessels, (*b*) a glial proliferation which varied in intensity with the degree of atrophy, and (*c*) proliferation in the mesoblastic tissues round the blood-vessels and without, forming the lamina cribrosa. The writers considered that the hypothesis which best explained all the known facts of tumor papillo-œdema was that, owing to the rise of intracranial pressure, there was a communicated rise of pressure in the nerve sheath. The portion of the central vein lying in the nerve sheath behaved, in response to this raised pressure, like a cerebral vein, and the blood pressure in it was consequently

raised to the same extent. This produced a congestion of all the connections of the central vein distal from that point. In addition to causing venous congestion the raised intra-vaginal tension obstructed the normal drainage of lymph from the disk and nerve, and caused a lymph stasis, so that there was both an increased output and a diminished drainage. The tissue tension in the nerve itself was raised so there was no marked difference between intravenous pressure and tissue pressure until the lamina cribrosa was reached; also the range of action of the lower normal intra-ocular tension. The paper was illustrated by a number of lantern slides.

Mr. JOHNSON TAYLOR asked whether the authors had had any case early enough to confirm what was clinically found, viz., that the earliest evidence of optic neuritis was in the upper and inner part of the disk. He had under care at present a case which confirmed that. Dr. JAMES TAYLOR spoke appreciatively of the extensive nature of the research. It occurred to him that it might lead to a revival of the old method of tapping the optic nerve from the front, with the view of relieving the œdema. If so, that would cause one to view more hopefully cases of extreme papillo-œdema. Dr. GORDON HOLMES, in reply to Dr. Taylor, said the method mentioned would only be feasible if a fistula were left in the sheath, to allow the cerebro-spinal fluid to drain away. Mr. PATON replied that the papillo-œdema nearly always commenced at the upper border first, and later in the lower. But when only the upper border showed œdema, there was shrinkage of the tissue. The disk looked normal, but there was evidence of œdema commencing at its upper edge.

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. EDWARD B. COBURN, Secretary.

MEETING OF NOVEMBER 21, 1910. DR. H. W. WOOTTON, CHAIRMAN, PRESIDING.

Dr. W. E. Lambert presented a case of **lens extraction in a patient with high myopia**. The young woman, aged 28 years, had been myopic since birth and in March, 1910, she had a myopia of 22 D. in each eye with only $\frac{2}{200}$ vision with correction. There were changes in both lenses, floating opacities in the vitreous, and marked changes in the fundus of both eyes. Both were operated upon by the method of Fukala with needling and extraction. The right eye was needled in May and as the first was insufficient a second was done three days later with marked effect. Three days later, linear extraction was performed with washing out of the cortical substance and discission later. Vision was $\frac{2}{40}$ without correction. The left was then operated upon in the same manner, but there resulted thickened capsule and iritis with almost complete occlusion of the pupil. Discission was performed and vision of $\frac{2}{30}$ resulted. Astigmatism of 3 D. against the rule, as is usual, required correction. Potassium iodide was given to promote absorption of the vitreous opacities. Dr. Lambert recalled two similar cases operated upon two years ago, one of which he had seen recently. There were changes in the lens and fundus. Vision of R. $\frac{2}{40}$ and L. $\frac{3}{20}$ was obtained. Another case in a young girl but with not many changes. Myopia was R. -19 D. and L. -20 D. Vision of $\frac{2}{30}$ with a weak plus glass was retained for four years. In

his experience it is much better to make a marked traumatic cataract. Glaucomatous symptoms developed in twenty-four hours in one case and were followed by linear extraction and the usual treatment. In other cases in which he had been more conservative the results had been less favorable.

Dr. E. B. COBURN presented a case of **leech-bite of the cornea.** The patient, a Russian Jew aged 22 years, was bathing in a small river near Odessa and lay down on the bank and fell asleep. He was awakened by a severe pain in the right eye and found a leech which dropped from the eye. There were pain, marked swelling of the lid and face, fever, and loss of sight. Treatment lasted two months. Sight has been gradually diminishing and now he is only able to count fingers at about one foot. There is now a crater-shaped depression in the centre of the cornea with a dense central opacity which has a slight resemblance to the characteristic mark left by the bite of a leech; there is an area of less opacity surrounded by a circular, dense opacity which marks the boundary of the crater. The tension of the eye was normal. The pupil could be seen only in part from the extreme side.

Dr. H. W. WOOTTON discussed the case and said he thought there was some error in regard to the facts in the case. The patient may have been deceived as to the cause of the trouble or for some reason may have manufactured the story.

Dr. W. E. LAMBERT said that he would advise the use of dionin to cause absorption of the opacity. He had also used irrigation with a solution of nitrate of silver $\frac{1}{20}$ to the ounce.

Dr. L. W. CRIGLER presented a case of **rupia of the upper lid treated with cacodylate of soda.** The patient, a man aged 27 years, presented himself for examination in September, 1910. He was found to be affected with specific fauces with multiple rupia on the body. He gave a history of an initial lesion in July. He states positively that he has no knowledge of former infection. He was put on intramuscular injections of salicylate of mercury, which were continued for four weeks, when the rupia developed on the upper lid and began to spread. Other rupia became larger and some were as large as a silver dollar. Wassermann reaction was positive. Daily

injections were then made of sodium cacodylate of ¾ grain and were continued for one week. Within 48 hours after the first injection the rupia on the lid became clean and healthy as did most of the others. At the end of the week the lid was entirely healed. Other large ones had healthy granulations springing up and practically no discharge. Ten days from the first injection, Wassermann was again tried and found negative. Injections were resumed after an interval of one week and have been given every other day and will be continued until all signs of the disease have disappeared. The patient shows marked general improvement. He has had no other medicine except iron which was given two days ago.

Dr. LINN EMERSON presented a case of **cyst of the iris**. The patient, a man of 52 years, had been seen several times for advancing presbyopia and nothing abnormal was discovered until last August when he complained that vision was failing. The cyst was then discovered. The tumor appears to be almost entirely behind the iris and only the pigmented portion shows at the left side of the pupil under normal conditions. With the pupil dilated the tumor is seen to occupy about ⅔ of the entire circumference of the iris and gives the pupil a decided U-shape with the pigmented portion of the tumor showing. Vision is $\frac{20}{20}$. There is slight cupping of the disk and there has been plus tension after the use of euphthalmin. A sarcoma of the iris is a possibility and the patient had been examined at the Manhattan Eye and Ear Hospital by a number of oculists, some of whom had pronounced it a cyst and others were uncertain. Transillumination does not show any thickening in the iris or ciliary region.

Dr. A. DUANE discussed the case and said that it looked like a melanoma of the iris but that it was impossible to distinguish between that and sarcoma. The rapid growth and the location suggest the desirability of enucleation.

Dr. O. SCHIRMER said that the tumor did not look like a cyst but more like one of those rare cases of circular sarcoma of the ciliary body. Some cases show only hypertrophy of the pigment layer of the iris. The symptoms are similar and enucleation shows that the tumors are benign growths, consisting chiefly of fibrous tissue.

Dr. J. E. WEEKS remarked that we must not forget the cases of cystic degeneration of the iris in glaucoma. The pupil reacts and this might also occur with cysts but not with solid masses. Again, it may be a combined tumor, possessing the properties of both. The main tumor may be in the ciliary body. He was not willing to say that it was simply a cyst.

Dr. W. E. LAMBERT presented a case of **perforating wound of the cornea with a cilium in the anterior chamber.** The patient, a young girl, was struck in the eye with a tack, causing a perforating wound of the cornea and producing a traumatic cataract. A cilium was in the anterior chamber, with the root in the upper angle of the anterior chamber and the shaft of the hair hanging down across the pupil. At the root end was an enlargement, giving the appearance of an exudate or a beginning cyst.

Dr. J. E. WEEKS said that he had a similar case with a cilium in the anterior chamber and that he was able to remove the hair and there was no further trouble.

Dr. LAMBERT said that he purposed operating in this manner.

Dr. W. B. WEIDLER presented a case of **pemphigus of the conjunctiva**. The patient, a Russian, aged 70 years, stated that his eyes never troubled him until six months ago. He was first seen four months ago when the edges of the lids were covered with dried secretion, yellowish in color and matting the lids together. The lids were thick and shrunken and a condition of total symblepharon united the lids to the eyeball to the very edge of the lids. The bulbar conjunctiva that was visible was thick and thrown into folds over the cornea. A small portion of the cornea could be seen. The eye presented the same appearance that we see in old trachomatous processes with shrinking. This describes the condition in the right eye. The left eye showed some matting of the lids with secretion. The symblepharon was slight. The conjunctiva was red and swollen, with the appearance of œdema in places. The corneo-scleral margin showed a number of small bleb-like formations and these were pearly white in color. At the limbus of the cornea were seen several small whitish areas which when gently rubbed with an applicator bled freely. In October the only change in the condition appeared to be that the symblepharon had increased and the

opening between the lids was less. Efforts to separate the lids were followed by considerable bleeding. The condition advanced in the right eye until at the present time it is impossible to separate the lids. The opening between the lids is reduced to *2mm*. There appears to be a curious swelling over the upper lid and directly under the skin in the subcutaneous tissues. There is also œdema of the upper lid. In November the bulbar conjunctiva of the left eye showed spots of necrosis which were white and bled freely on the slightest effort to examine the eye. After the bleeding there is the formation of synechiæ at these spots between the ocular conjunctiva and the lids. This occurred in the early stages of the disease. The conjunctiva was observed to be slowly extending over the cornea. The areas of necrosis, the ulceration, the bleeding, the synechia formations, later the cicatrization and the contraction, and finally the symblepharon describe the character of the progress of the disease. The flow of tears has ceased and there is a slight ulceration of the upper part of the cornea. Vision became greatly reduced with the progress of the disease and the general health of the patient also declined. An examination of the nose revealed a dirty, moist, shining membrane which is evidently an exudate. It does not seem to bleed and cannot be stripped off. This seems to be associated with a fibrosis, as manifest by the firmness of the union of the exudate to the subjacent parts, second by the bloodlessness of the surface, and third because at the posterior nares there is a narrowing by fibrous contraction. It is not the clinical picture of membranous rhinitis or diphtheria nor of syphilis or of rhino-scleroma. There is no history of syphilis. The blebs in the conjunctiva resemble the lesions sometimes seen in pemphigus of the throat. The son said that he thought the eye trouble was caused by the nasal disease. A von Pirquet test was made with the crude, the 10%, and the 50% solutions, but there was no reaction. A Noguchi test was also negative. A culture from the secretion of the eyes showed the presence of streptococci and pseudo Klebs-Loeffler bacilli. The treatment has consisted of tonics and the local use of atropin, boric acid, protargol, olive and castor oil, and albolene. No attempt was made at operation as the patient objected.

Dr. H. W. WOOTTON said that only two cases had been shown before the Section in eight years.

Dr. W. B. MARPLE said that these cases tend to progress unless skin flaps are grafted in.

Dr. C. W. CUTLER had seen several cases in the last few years. One he had followed for several years and it had remained stationary.

Dr. O. SCHIRMER thought this had the appearance of a typical case. He had observed three cases extending over four years. There is little risk that the patient will become absolutely blind.

Dr. F. S. SHERMAN said that he had presented a case of this kind about a year ago. There was almost no progress in that case, which was the first case he had ever seen and this case was the second.

Dr. E. B. COBURN called atttention to two cases recently reported by Dr. Landolt of Paris who had made skin grafts from the temple. One case was permanently checked and the other had relapsed but had been cured by a second skin grafting.

Dr. W. B. MARPLE showed a case of **suspected foreign body in the eye.** The case was shown to illustrate the necessity of careful diagnosis and the use of all means to arrive at a correct diagnosis. The patient gave a history of foreign body in the eye fifteen years previously. There was a dark spot on the iris and the eye was sensitive. A foreign body on the cornea accounted for the irritation and the spot on the iris was a pigmented nævus. There was also an opacity of the lens where the first foreign body had located in the eye as revealed by an examination with X-rays.

Dr. E. B. COBURN presented an **improved astigmatic axis finder.** It consisted of a revolving cell with lens holder to which was attached a pointer eight inches long which indicated on a scale the degrees of inclination of the cylinder. A handle attached to the cell enabled it to be revolved by either the physician or the patient. With such a large scale the accuracy of the reading was much increased.

Dr. G. W. FITZ presented a **pupillometer** and its field of usefulness, with demonstration. It was intended for the accurate study of the pupillary reactions. In principle, the

apparatus depends upon the fact that an opaque object held close to the eye and centrally in front of the pupil will cast a shadow upon the retina only when it is at least as large as the pupil itself. It could also be used as a photometer and it was intended to employ it for that purpose to determine the illumination of schools and for similar purposes.

Dr. A. DUANE said that the instrument had a wide range of usefulness in delicate ranges of pupillary changes. He had measured several thousand pupils, usually under a mydriatic, and the best instrument he had found to be a modified Priestley Smith keratometer. The great difficulty is the corneal reflections. Another valuable method is with the V which measures to ¼ of a millimetre. He had suggested that the scale be placed on transparent celluloid, but found that such a modification was already in use.

Drs. M. COHEN and H. NOGUCHI read a paper entitled: **Relationship of the so-called trachoma bodies to conjunctival affections**, and a lantern-slide demonstration of the bodies was given by Dr. Noguchi.

This paper is published in full in these ARCHIVES, Vol. XL., No. 1, p. 1.

Dr. O. SCHIRMER opened the discussion and emphasized the success of the *non*-treatment of these cases of blenorrhœa without complications. All were taken in the early stage, but were severe cases. He called attention to the entire absence of these bodies in follicular conjunctivitis. This seems to point to a distinct difference between follicular conjunctivitis and trachoma and may help us to differentiate in this way between the two diseases. The significance of these bodies is uncertain though they seem to be allied with gonorrhœa. He believes that some relation will eventually be demonstrated between these bodies and gonorrhœa.

Dr. J. E. WEEKS congratulated the readers on their careful and instructive work. It seems to lead to the possibility of a means of differentiation of the different forms of disease of the conjunctiva. It was previously thought that all cases of blenorrhœa were due to the gonococcus, but it was found that it may be due to any one of a number of different germs. So, also, granular conjunctivitis may be due to different agencies. Unclean solutions of atropin and eserin cause

granular conjunctivitis. In Berlin these bodies have been found in ophthalmia neonatorum without gonorrhœa. That cases of ophthalmia neonatorum may be successfully treated with simple cleanliness does not surprise him as he has cured cases with solutions of boric acid without complications.

Dr. E. GRUENING took exception to the remark of Dr. SCHIRMER that trachoma is more often diagnosed here than in Europe. Here follicular conjunctivitis is considered to be trachoma at Ellis Island. There may be follicles at the angles but none in the upper tarsus, and if there are none in the transition fold then we do not have trachoma. If there are follicles in the transition fold and in the tarsus then there is trachoma. Dr. Stoner has excluded many cases of follicular conjunctivitis.

Dr. STONER believes that different types of trachoma can be identified, but that oculists do not agree as to the diagnosis of the different forms of the disease. He thinks that we should formulate a description of the disease. The Government calls follicular conjunctivitis a dangerous disease. On the East Side the disease is often handed down from generation to generation. He maintains that he has successfully kept out trachoma. Oculists have visited him at Ellis Island who made diagnoses of trachoma and follicular conjunctivitis and were followed by other oculists of equal reputation who had quite disagreed with the diagnoses of the preceding oculists.

Dr. C. B. MEDING said that these remarks tallied with our clinical experience. About six or seven years ago the Board of Health formulated plans to examine the eyes of the school children. He disagreed with their technique and their ability to differentiate trachoma from follicular conjunctivitis. About 75% of the cases called trachoma yielded to simple methods of treatment and therefore could not be trachoma. A rapidly waning disease though simulating trachoma in the early stages is not trachoma. He believes that conjunctival irritations change their appearance from day to day and the diagnosis may vary with the condition of rest and cleanliness.

Dr. J. H. CLAIBORNE asked if it were customary for the physicians at Ellis Island to turn the lids with forceps. In

his opinion the lids can only be completely turned by this method.

Dr. STONER replied that this method was employed whenever necessary. He further said that if the United States Government was making errors in diagnosis he would suggest that a committee be appointed to investigate the matter and define the disease. Cases in this country are treated, but the cases at Ellis Island are important because the patients cannot be kept for observation and treatment, but a diagnosis must be made at once, which either admits the patient or he is rejected and deported.

In conclusion, Dr. COHEN expressed his thanks for the discussion which the paper had elicited and the favorable comments.

Dr. NOGUCHI described at some length the method of carrying out these experiments. The material was taken from typical cases of trachoma from which no trace of gonorrhœa could be discovered either by smear or by cultivation. This material was used on twenty monkeys, in whom it is not possible to produce gonorrhœal infection.

The Section then went into executive session. Dr. Claiborne nominated Dr. H. W. Wootton for Chairman and Dr. E. B. Coburn for Secretary for the year 1911. The nominations were seconded and the vote being taken these names were unanimously nominated.

MEETING OF DECEMBER 19, 1910.

Dr. J. H. CLAIBORNE showed a case of **trachoma after operation by the method of combined excision of Heisrath and the tarsal resection of Kuhnt.** He said that in cases of trachoma it was not only necessary to cure the case but to prevent the infection of others as well. Many of the cases shown that were operated by this method were not cured for some of the infectious elements still remained. When these cases go to cicatricial contraction the tarsus is involved and is the essential principle of the trouble. If we get rid of the tarsus the trouble subsides. The tarsus causes the shrinking of the conjunctiva, xerosis, and destruction of the eye. This operation ought to be restricted to old cases. The lower lid was not the cause of pannus, hence why operate

on the lower lid? He operated only upon the upper lid. He had devised a new lid clamp similar to Desmarres' but with the screw reversed. The upper of the two blades of which the instrument was constructed was oval in shape, with the outer side of the oval open, and on the two arms of the oval were two short, sharp points to hold the lid and to prevent it from slipping out of the grasp of the instrument. The lower flat blade was fenestrated to allow the points to penetrate. By means of this clamp a bloodless operation could be performed, whereas with the old method there was free bleeding and the field was obscured and from thirty minutes to an hour was required. Of course as he did only the upper lids the time was shortened on that account. After applying the clamp, an incision was made along and parallel to the lid border and about *2mm* from it down to the muscle. The tarsus and conjunctiva were dissected up with scissors and removed at the upper margin of the tarsus. Three sutures armed with two needles were passed through the conjunctival margin at regular intervals along its surface and the clamp was removed and the lid restored to its normal position. The needles were then inserted into the lid just back of the cut edge of the conjunctiva and brought through on to the skin surface and tied over a small piece of cotton. A point was made that the sutures were parallel and not perpendicular to the lid margin, and this was supposed to allow some retraction of the conjunctiva and so prevent marked shortening of the conjunctival sac. The operation requires from fifteen to twenty minutes to perform. He expressed the opinion that this operation was doomed because unnecessary, as these old cases were being kept out of this country through the careful examination of foreigners at Ellis Island. This operation is not intended to cure the trachoma, though it may remove a certain amount of infected tissue, but rather to relieve an old trachoma and make a bad case somewhat better. The patient is relieved almost instantaneously.

Dr. T. R. CHAMBERS opened the discussion and asked if sandpaper had ever been used on cases of trachoma by any of the members of the Section. He reported three cases operated upon in this manner with pleasing results; the disease did not, however, involve the tarsus but the conjunctiva only.

Rough sandpaper was sterilized in alcohol and then, with forceps, small pieces were rubbed over the conjunctiva. In children, somnoform anæsthesia is preferable, but in adults the operation may be performed with cocain. No claim to originality was made.

Dr. W. E. LAMBERT said that he thought this method had been reported before.

Dr. F. VALK said that the method of using sandpaper was reported about a year ago. The best method of using it is to make a small roll with the rough side out. In speaking of Dr. Claiborne's operation he said that many of the cases of follicular conjunctivitis were benefited by using the roller forceps. He called attention to the two varieties of trachoma. He asked if there was any difficulty in rotation of the lid after this operation.

Dr. CLAIBORNE replied and said that he operated only in cases of scar tissue of trachoma with pannus, ulceration, etc. The operation should never be performed in cases of follicular conjunctivitis. He gave credit to Dr. Coburn for the suggestion of placing sharp points on the arms of the instrument to prevent slipping when the field was bloody during the operation. The broad piece of the instrument had been diminished to the size of the tarsus as this facilitated the turning of the lid in cases with abbreviated cul-de-sacs.

Dr. H. W. WOOTTON said that as he had performed this operation it was very bloody and he considered it a great advance if it could be made a bloodless operation. The tarsus and the conjunctiva of the fornix are both removed. As to the lower lid, if there is trachoma tissue present it may be excised with the tarsus and the condition be relieved. If granulations spring up after the operation, they must be cut off. He would not think of operation in cases of follicular conjunctivitis, as one of the distinguishing points is the absence of thickening of the conjunctiva and tarsus in the latter disease. In the trachoma of adults the tarsus of all four lids is removed.

Dr. CLAIBORNE said that he pays no attention to other tissues but only excises the tarsus.

Dr. J. GUTTMAN asked the results in the cases operated upon by Dr. Wootton.

Dr. WOOTTON, in closing, stated that he had done about 100 operations and that the results were universally good except in three cases which had suffered relapses. He was very optimistic as regards the operation, especially for the laboring classes. Among the rich he preferred to use forceps and treatment. The operation was easily performed and no harm was done. He states that he did not wish to be understood as claiming the distinction of having been the first to perform this operation in this country. As early as 1898 or 1899, Dr. Casey Wood had performed about 50 of them and in a monograph had described the technique.

Dr. E. B. COBURN presented a case of **high myopia with fundus changes for lens extraction.** This should have been put as a question, as the opinion of the members was desired as to the suitability of this case for operation. The woman, a Russian Jewess about 29 years old, was examined at Cornell College Dispensary in 1903, at which time she was able only to count fingers at six feet. With −12 D. vision was $\frac{20}{70}$. She had punctate polar cataracts in both eyes and floating opacities in the vitreous. There was marked diffuse atrophy of the entire fundus and numerous collections of pigment. These pigment masses were suggestive of retinitis pigmentosa but were atypical in arrangement. Later it was discovered that there was marked concentric contraction of the fields of vision. The vision gradually deteriorated until at the present time she is wearing −16 D. lenses which give only $\frac{1}{200}$ vision. The fields are contracted to an area of 10° around the point of fixation. It seemed a fair question to ask how much of the change was due to the myopia and how much to the progression of the retinal disease, and what effect would the removal of the lenses have in arresting the progress of the disease.

Dr. W. E. LAMBERT opened the discussion and said that this was not a typical case for Fukala's operation, and though it was not especially indicated still it was justifiable. Vision may be improved. Of course the retinitis pigmentosa may go on to complete blindness. He advised that this operation be done in an attempt to arrest the disease in an otherwise hopeless case.

Dr. J. H. CLAIBORNE said that the operation was not indi-

cated and he advised against it. The ultimate result would be blindness, and however successful the operation the operator would be blamed for the blindness.

Dr. LAMBERT remarked that he thought the operation might give temporary benefit.

Dr. F. VALK thought he had read somewhere in medical literature that cases of this kind had received decided improvement from removal of the lens and he suggested that the reference be looked up.

Dr. W. B. MARPLE presented a case of **thrombosis in a branch of the retinal vessels.** The patient, a man, was lifting something and experienced sudden loss of sight. He was seen shortly afterwards and was found to have a thrombosis in a branch of the retinal vessels. The vessel could barely be distinguished and there was a whitish area of œdema and hemorrhage.

Dr. W. B. WEIDLER discussed the case and said that he had observed blood in the distal end of the vessel. He asked how it was possible to distinguish thrombosis from embolism.

Dr. MARPLE replied that it was not always possible to distinguish between the two conditions, but that aid in making the diagnosis was secured by other symptoms. Attention was called to the rôle of arterio-sclerosis and arteritis obliterans in causing these conditions. A part of the general arterio-sclerosis was shown by the appearance of the blood-vessels in other parts of the retina. At times there has been blood in the vessels and at other times it has been absent.

Dr. W. B. MARPLE also presented a case of **removal of large piece of steel from the interior of the eye.** The man was using an electric drill at the time of the accident when a piece broke off and penetrated the eye. The position of the foreign body in the eye was determined with X-rays and it was then extracted with a magnet. The first attempt was made with a Johnson magnet, but this failed, and then the Haab magnet was tried and was successful in removing the piece of steel through the cut in the external horizontal plane of the eyeball. The splinter of steel was 15*mm* long and weighed 0.607 gramme. After removal of the foreign body scleral sutures were applied. A condition of low tension resulted, and as measured with the tonometer was less than

1*mm* of mercury. To determine the strength of the Johnson magnet the foreign body was placed on a smooth surface and it was found necessary to approach the end of the magnet within $\frac{1}{8}$ inch to move it.

Dr. S. F. HALLOCK said that he had reported a similar case six or seven years ago. A man was working in a trench and holding a drill when a piece broke off (about ½ larger than the piece in Dr. Marple's case) and flew into the eye. It passed through the upper lid and cornea and lodged in the eye. The patient was seen within an hour. When the eye of the patient was brought within a foot of the Haab magnet the eye could be seen to be drawn out of the orbit. Steel forceps were then introduced to hold the lips of the wound open and the magnet was applied to the end of the forceps, when the foreign body jumped out. He was advised to have the eye removed, which though it had healed up in two weeks was soft. This advice was refused. Two and a half years afterwards he sued for $5000. The company held that he assumed the risk. The jury gave him a verdict but it was compromised for $400.

Dr. H. W. WOOTTON presented a case of **coloboma of the macula.** The patient, a young woman aged 20 years, wore glasses but said that she never could see well with her left eye. Vision was R. $\frac{20}{20}$, and L. $\frac{20}{200}$. The fundus of the right eye was normal. In the fundus of the left eye at the macula was a circular coloboma with pigmented edges. This was about two disk diameters in size and was about 3 D. deep. Some remnants of choroidal vessels could be seen at the bottom of the depression. About midway between the coloboma and the optic disk was a circular accumulation of pigment that was about the size of the disk. The pigmented choroidal ring around the optic disk was increased in size. There was no central vision. The scotoma was absolute. This would seem to indicate that the retina was not complete or had not developed. Collins and Lang in Norris and Oliver's text-book state that this condition is due to an attachment of the retina to the mesoblast. This is evidently a congenital coloboma of the macula, though a few floating opacities in the vitreous might raise the suspicion that it was due to a choroidal inflammation.

Dr. J. WOLFF presented a case of **tumor of the orbit** in a little girl who was first seen at Mt. Sinai Dispensary. Seven weeks previously her parents had noticed a change in the left eye. The child had had no disease and did not suffer from pain or headache. On examination there was found marked exophthalmos, the eye projecting forwards about 4*mm*. Movement of the eye upward was restricted while motion outward was only slightly diminished. The eye was straight at first. An examination of the fundus revealed a choked disk of about 4 D. in height. The nose was examined and a large middle turbinal was found pressing on the septum, but there was no pus or secretion. There was no pain on pressure and nothing could be felt in the orbit by palpation. There was, however, marked resistance to pressure backward. On the following day the eye was convergent. Later the eye became straight and this condition has alternated and at present the eye is convergent. Vision of the right corrected (with a large amount of compound hyperopic astigmatism) is $\frac{11}{10}$. There was no history of trauma. On placing a stethoscope over the closed eyelids of the child the respiration sounds could be heard much more distinctly over the left side, from which it was inferred that the sound conduction was better, due to the presence of some fairly solid substance in the orbit on that side. The middle turbinal was removed and the ethmoid cells opened on that side, but no disease was found and on examination the mucous membrane was reported normal. During the past four weeks the only change noted is an increase in the exophthalmos and the neuritis and a diminution of the vision to $\frac{8}{11}$. There is no loss of sensation. Transillumination is negative. X-ray picture shows a slight thickening on the left side. The question whether a Kroenlein operation was indicated was asked of the members of the Section.

Dr. T. R. CHAMBERS began the discussion and said that he thought a Kroenlein operation would show a tumor of the optic nerve.

Dr. E. S. THOMSON was of the opinion that an operation was decidedly indicated and that a tumor would be found, though it might be that the tumor did not involve the optic nerve.

Dr. G. S. DIXON said that he thought that a neuro-fibroma might be found. They grow to considerable size. They are quite rare. He has seen only two cases.

Dr. J. H. CLAIBORNE declared against the Kroenlein operation as being an unnecessary mutilation. He had reported a case at Washington from which he had removed a tumor from the orbit, that was seven-eighths of an inch long and as large as his thumb, by cutting through the brow and reaching the tumor, that was *12mm* deep. If necessary the bone may be cut from the upper and outer orbital margin to increase the room and get the tumor out. The Kroenlein operation should be preserved for cases of mammoth tumors.

Dr. E. S. THOMSON remarked further that Parsons has made the observation that in tumors of the optic nerve the protrusion is directly forward. It depends, of course, how the tumor grows. The tumor in this case was evidently on the nasal side and far back in the orbit. He contended that the Kroenlein operation was the operation of choice.

Dr. H. W. WOOTTON coincided with the last speaker and said that the tumor was undoubtedly far back in the orbit. An enucleation of the eyeball might be necessary to remove the tumor.

In closing, Dr. WOLFF said that his objection to the method suggested by Dr. Claiborne was that in cases of hemorrhage it could not be controlled. He believes that the tumor is located low down on the nasal side on account of the restriction of movement. He had decided to try a Kroenlein operation. The fact that the auscultation sounds were louder on the affected side he ascribed to the presence of a solid tumor.

Dr. F. J. PARKER read a paper entitled **optic atrophy from traumatic asphyxia with report of a case.**

This paper appears in this number.

At the conclusion of the scientific programme, Dr. Claiborne moved the election of Dr. H. W. Wootton for Chairman and Dr. Edward B. Coburn for Secretary for 1911, their names having been nominated at the previous meeting. Dr. Bell seconded the motion, and these officers were declared elected by a unanimous vote.

MEETING OF JANUARY 16, 1911.

Dr. G. H. GROUT described **Von Blaskowic's operation for distichiasis** and presented two cases operated upon by this method. The operation is performed in the following manner: The first incision is made about *2* or *3mm* from the lid margin so as to avoid the hair follicles and in a line parallel to the lid border, extending down to the tarsus. A second incision is made *1mm* from the first and parallel to it and extending for the same length and also down to the tarsus. This leaves an island of skin and underlying tissue, *1mm* broad, attached to the tarsus. The lid is now split by an incision in the intermarginal space connecting with the first incision, thus freeing a strip containing the cilia. The island of skin is now deflected and brought down into the intermarginal cut with the skin surface showing on the lid margin, and is secured there by the use of two mattrass sutures. Thus there is no destruction of tissue. The fullest effect of the operation is shown about one month later. Of a series of thirty operations performed in this way, seven were performed by himself and all the patients had been much benefited.

Dr. H. W. WOOTTON asked if the skin that was inserted grew hairs.

Dr. GROUT replied that he had followed these cases from six to nine months without the appearance of any hair and with no sign of irritation.

Dr. A. KNAPP presented a case of **fat implantation in Tenon's capsule after enucleation.** This young woman was sensitive about the appearance of an enlarged eye which she had had for many years and the operation had therefore been done for cosmetic purposes only. The eye was enucleated and a large piece of fat from the thigh was implanted in Tenon's capsule and the conjunctiva sutured over it, there being no attempt to unite the recti muscles. This was one of three cases operated last spring. The ordinary artificial eye was worn over the stump thus prepared and was fully as prominent as the fellow eye and had excellent mobility in every direction.

Dr. O. SCHIRMER discussed the case and said the result was quite remarkable. He had done the operation six or

eight times. The final result in all cases was shrinking but, even so, the result was better than by the old method. In dogs the fat is absorbed and replaced by connective tissue and this shrinks. He asked if there was not an over-effect in the beginning.

Dr. KNAPP referred the question to Dr. Griffith, the interne at the New York Ophthalmic and Aural Institute.

Dr. GRIFFITH explained that the immediate effect was an over-effect.

Dr. A. KNAPP presented a case of **extensive epithelioma of eyelids, orbit, and accessory cavities.** The history given by the patient, a man, was that eighteen years ago a mole appeared which in time produced a scab which he repeatedly picked off. This process continued until about three or four years ago when it began to grow. When seen last April the growth involved the inner third of both eyelids, the sclera, antrum, frontal sinus, ethmoid, and extended through the septum to the opposite side. The eye was removed and the disease was eradicated as thoroughly as possible. There was thickening of the skin about the caruncle on the opposite side. Application of carbonic acid snow was tried upon this but without effect, the infiltration under the skin gradually increasing. A second operation was performed, removing part of the nose between the orbits and the defect covered with a pedicle flap from the forehead. At the present time a large opening from the inner angle of the right orbit permits an extensive view of the nasal cavities and the septum and the large opening in the septum.

Dr. A. KNAPP also presented a case of **angioma of the eyelid treated with carbonic acid snow.** This was an eleven-months-old infant with an angioma of the eyelid characterized by thickening of the skin and a mass of large blood-vessels. This involved the edge of the lid, making excision with the knife undesirable. One application of the carbonic acid snow caused the growth to shrivel up and drop off.

Dr. W. P. EAGLETON said that he had used snow in the treatment of epithelioma and angioma. He asked if it could be used in cases of growths of the conjunctiva.

Dr. KNAPP replied that he had seen it used in one case of nævus of the conjunctiva.

Dr. O. SCHIRMER asked if the snow acted on the skin or through the skin.

Dr. KNAPP replied that he did not know the exact pathological process.

Dr. F. M. WILSON said that he had employed it in nævi of the face but that though the case was treated fifteen months there was no effect. The treatment failed.

Dr. H. W. WOOTTON said that the skin men differ as to the exact method of the action of the carbonic acid snow.

Dr. KNAPP concluded the discussion by saying that he hoped to have Dr. Dade present at some future time who would describe the mode of application and would show a half dozen other cases treated in this same manner.

Dr. C. W. CUTLER reported a case of **optic neuritis from sinusitis with unusual features**. It was a case of optic neuritis of one eye following empyema of the posterior ethmoidal cell on the same side. The neuritis was preceded by pain over the eye and sudden diminution of vision, followed in three days by œdema of the nerve, which was elevated 1.5 D. Vision was $\frac{20}{200}$. Two days later fingers could be counted at three feet. The middle turbinal was removed and Dr. Culbert curetted the ethmoidal cells, although no free pus was seen, the only indication for this procedure being the optic neuritis. The left pupil contracted less well to light and showed slight hippus. After the opening of the ethmoidal cells and free drainage was secured, the neuritis improved so that in two weeks the vision was normal. At the present time (two months after the operation) there remains a pale ring surrounding the upper and inner margin of the disk, about one half disk diameter from it, over which the nerve fibres are clearly marked. This ring was not visible on repeated examination before the present attack. During the subsidence of the œdema, it became visible and was at that time elevated about one diopter. Since then, the pale line has remained about the same, indicating presumably a fold in the retina, and is the only evidence left of the previous existence of the neuritis. This condition was illustrated by a painting by Dr. Geo. Young.

Dr. W. L. CULBERT opened the discussion and said that both turbinals were swollen and hypertrophied and pressed

on the septum. Pain was referred to the left side. No pus appeared until the turbinals were removed. The anterior two-thirds was removed and the posterior part and the anterior and middle cells of the ethmoid were curetted. The operation was performed under cocain anæsthesia. He stated that he had seen other cases with no pus visible. In some cases the pus is either locked up in the cells or passes down the throat. If there is much discharge of pus there are no eye symptoms, while if the pus is confined then eye symptoms develop.

Dr. J. WOLFF asked if the nasal diagnosis was made before or after the operation.

Dr. CULBERT answered that Dr. Cutler urged the operation as he felt certain that the neuritis was due to nasal causes and that the operation was necessary.

Dr. J. H. WOODWARD asked the condition of the sphenoidal sinus.

Dr. CULBERT replied that the sphenoidal sinus was opened but nothing was found.

Dr. W. P. EAGLETON asked if the turbinals were water-logged.

Dr. CULBERT answered in the affirmative.

Dr. EAGLETON continued and said that he had seen a number of similar cases and that an opening of the cells cures the cases by relieving the œdema.

Dr. CUTLER desired to know what was the meaning of the concentric ring around the disk seen in the picture.

Dr. M. COHEN presented a case of **papillo-œdema from ptomaine poisoning.** A young man, aged 22 years and with previous history negative, ate some sausage at Coney Island and two days later had severe headache with dizziness and vomiting which lasted for nearly a month. Vision in right eye was fingers at five feet and in the left eye, $\frac{20}{40}$. The reflexes were sluggish. The veins were tortuous. A physical examination as well as a neurological one was negative. So also were the blood pressure, Wassermann, and urine. The fields of vision were normal. Treatment with Hg and KI was begun but stopped when the physiological effect was produced. X-ray pictures by both Dr. Cole and Dr. Cauldwell showed calcification near the pineal gland, evidently some concretion of the salts of lime. Pressure may thus be made

on the third ventricle and so on the lateral ventricle and so secondarily to produce choked disk. Plates and pictures were exhibited. The question was whether the choked disk was due to ptomaine poisoning or from pressure.

Dr. O. SCHIRMER said he had seen a similar case which lasted only a few weeks. He thought the outcome would be most favorable.

Dr. J. H. WOODWARD thought that the condition was due to cerebral tumor as the three cardinal symptoms, choked disk, headache, and vomiting, were present. It might be an infiltration tumor.

Dr. H. H. TYSON said he had seen a similar case at the Vanderbilt Clinic which showed some improvement after the administration of KI. He called attention to the fact that this patient had a staggering gait.

Dr. W. B. WEIDLER showed a case of **elephantiasis lymphangioides of the upper lid** occurring in a girl of 16 years of age. She had always been well up to the present time. At the time when she left school a slight swelling of her upper eyelids was noticed which had become worse since. She was seen about one year ago at the Manhattan Eye and Ear Hospital and then there was pronounced swelling of both upper lids which seemed confined to the subcutaneous tissues of the lids. The skin was smooth and with no tendency to wrinkling; partial ptosis, which was more apparent than real. The lids drooped from the weight of the œdema. The swelling was compressible and movable. There seemed to be a serous exudate in the tissues as transillumination revealed no thickening. There was no pain on pressure. Some hyperæmia of the vessels could be observed. Urine examination, von Pirquet, and Wassermann were negative. Dr. GRAY said that it looked like a dermatolysis, but there was no thickening of the skin but rather atrophy with laxity. The well developed anæmia suggested a chlorosis. This condition is usually seen in the lower lids. Setons applied did no good. He had tried X-ray and high frequency currents, and internally, Blaud's pills and Fowler's solution.

Dr. H. H. TYSON remarked that he had seen a similar case operated upon by Dr. H. Knapp, who called the condition simply a redundancy of the skin.

Dr. O. SCHIRMER disagreed with the diagnosis and thought it might more properly be called blepharochalasis. In this condition there is a loosening of the palpebro-orbital bands and the skin falls down and lies on the eyelashes. The skin looks atrophic.

Dr. J. WOLFF reported the results of the Kroenlein operation performed on the girl, aged 9 years, who was presented at the previous meeting of the Section and in which a diagnosis of orbital tumor had been made. There was impaired mobility, choked disk of 4 to 5 D., and the nasal respiratory sounds on the affected side were increased over the eyelids. The operation was performed two weeks previously. First, however, the ethmoid cells were explored to be certain that the condition was not due to nasal accessory sinus disease. The orbit was then opened by Kroenlein's method and a spindle-shaped tumor was found behind the eyeball. It looked like a cyst but was found to be solid and composed of a brownish, friable substance. Masses which enveloped the optic nerve were removed. The growth appeared to have its origin from the sheath of the optic nerve. A microscopical examination proved the growth to be a spindle-celled sarcoma. There was considerable œdema and swelling at first, but the bone flap united and the wound healed. At the time of the operation, permission was refused by the parent to remove the eye and do a radical operation, but since the dangerous character of the tumor had been demonstrated permission to do exenteration of the orbit had been secured and the operation would be done soon.

Dr. H. W. WOOTTON commented on the report and said that the findings were quite in accord with the general opinion.

Dr. E. TÖRÖK reported a case of **tuberculous iritis cured by tuberculin.** This was a man, aged 21 years, who gave no history except that his eye was inflamed two and one half years ago. He had the symptoms of chronic irido-cyclitis with posterior synechiæ, Descemetitis, and opacities of the vitreous. A diagnostic injection was made with old tuberculin, which gave a reaction both local and general. In the way of treatment he received sixty-two injections of bacillary emulsion, the last about five months ago. The patient was now apparently cured and vision, which was $\frac{20}{200}$, is now $\frac{6}{10}$.

Dr. H. W. WOOTTON referred to several cases of keratoiritis, vascular keratitis, and iritis which he had treated with tuberculin. They had received crude tuberculin prepared by the Board of Health in doses of $\frac{1}{100,000}$ *mg.*

Dr. E. TÖRÖK read a paper entitled **dacryocysto-rhinostomia (Toti's operation), with demonstration of cases.** This paper appears in this number of the ARCHIVES.

Dr. H. W. WOOTTON discussed the paper and said that he did not think total extirpation of the lachrymal sac was the ideal operation in cases of abscess, because the eye becomes dry afterward. This stops the suppuration but does not stop the wetting. Extirpation of the inferior portion may sometimes cause sufficient effect, but this might be due to the fact that the ducts of the gland were occluded by cutting them during the operation. He has operated on three cases on the upper gland. As a result there is no discharge, the patients cannot weep, foreign bodies are not readily dislodged, and in one case trachoma was acquired. If Toti's operation is successful, these unpleasant conditions are obviated. Eight operations have been done at the Manhattan Eye and Ear Hospital according to this method, six by Dr. Wootton and two by Dr. Carhart. There were two failures, but they were the first cases operated upon. Two cases were still in the hospital. Some cases are successful and others are equal to total extirpation. In one case there was excessive hemorrhage, requiring one hour to do the operation. The operation may be done under cocain and adrenalin anæsthesia.

At the conclusion of the scientific programme, Dr. S. F. HALLOCK moved that the Secretary be instructed to prepare resolutions relative to the deaths of Dr. Kipp and Dr. Bradley, both of whom were members of the Section, and report at the next meeting. This motion was seconded and carried.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE THIRD AND FOURTH QUARTERS OF THE YEAR 1909.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

(*Continued from page 229.*)

XV.—PUPIL. (Reviewed by Prof. HUMMELSHEIM, Bonn.)

330. MARINA, A. **The ciliary ganglion is the peripheral centre of the pupillary reflex.** *Sixteenth International Medical Congress at Budapest.* Section on Ophthalmology, Aug. 28 to Sept. 4, 1909.

331. GUDDEN. **The behavior of the pupils in the newly born and in the first year of life.** *Meeting of the Society for Morphology and Physiology at Munich*, Nov. 16, 1909.

332. LANGE, O. **The anatomy of the atropinized and eserinized human eye.** *Meeting of the Ophthalmological Society of Lower Saxony at Hanover*, May 16, 1909.

333. HESS, J. **Demonstration of a patient with paradoxical pupillary reaction.** *Meeting of the Medical Society at Hamburg*, Feb. 9, 1909.

MARINA (330, **The ciliary ganglion is the peripheral centre of the pupillary reflex**) is of the opinion that the pathological condition of the ciliary ganglion and of the ciliary nerves is of great importance in the pathogenesis of the pupillary disturbances in tabes and paresis. He thinks it possible that the convergence reaction comes first through stretching of the short ciliary nerves, a hypothesis with which the re-

sults of his experiments in transplanting entire eye muscles in monkeys harmonize. Still it is probable that the cause of the convergence and accommodation reaction of the pupil is complex and not yet wholly explained. He emphasizes the point that he does not look upon the ciliary ganglion as the only centre of the light reaction of the pupil, but only as the peripheral, which does not exclude the presence of other centres.

GUDDEN (331, **The behavior of the pupils in the newly born and in the first year of life**) finds that the pupils of the newly born are not contracted during sleep, as in adults, but are moderately dilated. On waking they dilate only slowly. From the third month on they are smaller during sleep, from the ninth month on they dilate to the maximum on waking, as in adults. The ground for this difference he finds in the medullary unripeness. For one thing the connection between the optic nerve and the centre of the sphincter pupillæ is not complete. The dilatation on awakening, interpreted as a cerebral reflex, develops later.

LANGE (332, **The anatomy of the atropinized and eserinized human eye**) placed the eyes of a newly born infant, quickly enucleated after death, one in a warm aqueous 5% solution of atropin, the other in a similar solution of eserin. Marked mydriasis and miosis immediately took place. The eyeballs were then fixed in a 10% formol solution and hardened in alcohol. The central section through the cornea of the atropinized eye showed the pupil to be 6*mm* wide, the root of the iris thickened, the angle of the anterior chamber to be narrow, the lamellæ of the ligamentum pectinatum to lie close together with the spaces between them scarcely visible. The same section through the eserinized eye showed the pupil to be 3*mm* wide, the root of the iris thinned, the angle of the anterior chamber deep, the lamellæ of the ligamentum pectinatum separated, the spaces between them very wide. In the author's opinion these conditions furnish a good explanation of the effect produced by these drugs in glaucoma.

HESS (333, **Demonstration of a patient with paradoxical pupillary reaction**) exhibited a man 59 years old, infected with syphilis 25 years before, who had paradoxical reaction

of the pupils to light. All errors of observation were very carefully excluded. The miotic pupils dilated directly, not consensually, to the entrance of light, slowly increasing two or three times in size without previous contraction. Later the phenomenon became weaker and changed in so far that the right pupil once dilated consensually in a horizontal oval form. The patient had, six months and three months before, attacks of vertigo with tinnitus aurium at night without headache. He had no Romberg's symptom, no ataxia, no disturbance of the bladder; his reflexes were normal, Wassermann positive. Ophthalmoscopically the papillæ were in toto somewhat gray. The function of the right eye was normal; the left was slightly amblyopic, with a central scotoma and contraction of the color field. Diagnosis: Cerebral syphilis (?). The author points out that the symptom is important pathognomonically as indicating an organic nerve lesion. It was an action of the dilatator, whose centres, both cerebral and spinal, were destroyed.

XVI.—CHOROID. (Reviewed by Dr. NICOLAI, Berlin.)

334. HANSEL, H. F. **A case of bilateral macular coloboma.** *Trans. Amer. Ophthalm. Soc.*, 1909.

335. JENSEN, EDM. **Retino-choroiditis juxta-papillaris.** *Arch. f. Ophthalmologie*, lxix., 1, p. 41.

336. KIPP, C. J. **Hemorrhagic central chorio-retinitis in non-myopic eyes. A clinical contribution.** *Trans. Amer. Ophthalm. Soc.*, 1909.

337. GUGLIANETTI. **Vascular diffuse sclerosis with atrophy of the choroid of syphilitic origin.** *Archivio di ottalmologia*, Feb., 1909.

338. STEINDORF. **Note on the histology of sarcoma of the choroid.** *Berliner ophthalm. Gesellschaft*, July 15, 1909.

339. SUKER, G. F., and GROVENOR, L. N. **Metastatic carcinoma of the choroid. A critical study with case reported.** *Ophthalmology*, July, 1909.

340. POSEY, W. C. **Choroidal hemorrhage following operations upon the globe.** *Annals of Ophthal.*, July, 1909

HANSEL'S (334, **A case of bilateral macular coloboma**) case is the eighth of the sort on record. ALLING.

JENSEN (335, **Retino-choroiditis juxta-papillaris**) reports four cases which furnish a typical picture both functionally and ophthalmoscopically. In young, healthy persons without syphilis or constitutional taint, an exudate of about the size of the papilla appears on the margin of the papilla,

involving both the retina and the choroid. There is subjective darkening of the vision and a sector-shaped defect in the visual field. In the course of two months the infiltrate becomes absorbed, but the defect in the visual field remains unchanged. The disease may recur. The prognosis quoad visum is good. HELLGREN.

KIPP (336, **Hemorrhagic central chorio-retinitis in non-myopic eyes. A clinical contribution**) under the above title classifies a set of cases infrequently seen. There is a sudden onset of blurred vision, a dark grayish discoloration with small extravasations of blood at the macula, and later a grayish white patch is left with pigment especially at the border. He cites six cases. ALLING.

GUGLIANETTI'S (337, **Vascular diffuse sclerosis with atrophy of the choroid of syphilitic origin**) patient was a man 45 years old. Nothing of note in his family history. As a child he suffered from glandular tuberculosis; acquired syphilis when 30 years old. At first there was an iritis of the left eye, which recovered under mercurial treatment. Lately the vision failed notably in the course of a month. He had symptoms of myodesopsia, never of hemeralopia. He was of very slight build, and examination revealed a slight degree of arteriosclerosis. The fundus of the left eye showed the characteristic picture of sclerosis of the choroidal vessels, especially at the posterior pole, through the disappearance of the retinal pigment. In the periphery of the retina were points of pigment infiltration. The papilla showed distinctly the commencement of an optic neuritis. The trophic and functional alterations of the retina go to confirm the theory of Wagenmann concerning the part played by the choroid in the nutrition of the neuro-epithelial layer of the retina. CALDERARO.

STEINDORF (338, **Note on the histology of sarcoma of the choroid**), in the histological examination of a sarcoma of the choroid, found chromatophores in all layers of the retina throughout its entire extent up to the papilla and on the side opposed to the tumor.

SUKER and GROVENOR (339, **Metastatic carcinoma of the choroid. A critical study with case reported**) have found records of about sixty cases of this rare condition. Car-

cinoma of the eye is always secondary and the choroid is the most frequently involved. The breast has been the usual seat of the primary growth, and of these there are 39 cases. The lungs were first affected in six, the stomach in four, and the liver in three. The rest were scattered in various other organs. The uterus seems never to have been the primary seat. The most of the cases occur between the ages of 40 and 60 and in females. The metastases usually occur by means of a cardiac embolus entering through the posterior ciliary arteries. The tumor does not usually perforate the sclera, but there may be extra-ocular metastases. Increased tension is the rule, although it would appear that minus tension is more frequently found in carcinoma than in sarcoma. The left eye is more commonly involved. The average length of life after the ocular lesion appears is seven months. Enucleation is only indicated for the relief of pain. The authors append a careful pathological report of their case.

ALLING.

POSEY'S (340, **Choroidal hemorrhage following operations upon the globe**) experience includes two cases, one following immediately after a smooth extraction of cataract, the other after anterior sclerotomy in an eye from which the lens had been removed but which fell into a glaucomatous state. Intense pain accompanied both accidents and the eyes were lost.

ALLING.

XVII.—VITREOUS.

341. CALDERARO. **Contribution to the study of persistent hyaloid tissue.** *La Clinica Oculistica*, April–May, 1909.

CALDERARO (341, **Contribution to the study of persistent hyaloid tissue**) presents the results of his anatomical examination of two eyeballs with persistent hyaloid tissue. Only 10 similar studies have been made. He has collated all these cases and divides them into six groups according to their clinical appearance and the embryological factor that caused the anomaly. (1) Persistent hyaloid filament. In this group he places all observations in which a filament extends from the papilla to the posterior surface of the lens. (2) Præpapillary cones. When a semi-transparent, gray wedge of tissue situated over the whole or a great part of the papilla is

met with, which is at first large and becomes smaller, to end in a little knob from which a semi-transparent membrane extends with one or two short and slender filaments floating in the vitreous. (3) Persistence of Cloquet's canal. A more or less cylindric canal with extremely thin and diaphanous walls. Its diameter is little less than that of the papilla, to the posterior surface of the lens. (4) Hyaloid residue. In this group belong all anomalies which are formed by the presence of a portion of the embryonal hyaloid tissue, whether on the papilla or on the posterior surface of the lens. (5) Vasa hyaloidea propria and persistent hyaloid artery. This group includes the rare cases in which the embryonal hyaloid vessels persist and remain permeable without noticeable alteration in conformation of the eyeball. (6) Excentric hyaloid residue. Club-shaped hyaloid remains inserted above and below the papilla and associated with membranes and remains of permeable vessels. These are mesodermic remains in the choroidal fissure. All these anomalies do not represent tissue which should disappear and have persisted, but newly formed inflammatory tissue which has taken the place of the fœtal and preserved its form. The histologic examination of the persistent hyaloid remains has shown that they are composed of more or less compact newly formed connective tissue which has replaced the embryonal part where inflammation had taken place. No trace of embryonal tissue has been met with, for the embryonal hyaloid elements obey the physiological law and vanish when inflammation sets in. Hence all that is seen with the ophthalmoscope of these anomalies, with the exception of the vessels, is nothing but cicatricial tissue. As in their organization the cicatricial products reproduce the form of the embryonal tissues in which they developed, we can estimate approximately the time when the phlogistic alteration exercised its deleterious action upon the hyaloid tissue. CALDERARO.

XVIII.—GLAUCOMA.

342. FRANK, M. **Primary hemorrhagic glaucoma with probable sympathetic inflammation.** *Jour. Amer. Med. Assoc.*, Sept. 21, 1909.

343. JACKSON, EDWARD. **Recent observations concerning glaucoma.** *Amer. Journal of Ophthalmology*, Dec., 1909.

344. FUKALA. **What is to be done when the anterior chamber is not**

restored after an iridectomy for glaucoma? Sixteenth International Medical Congress at Budapest, Aug. 29 to Sept. 4, 1909.

345. OHM, J. **Glaucoma and cyclodialysis.** *Centralbl. f. prakt. Augenheilkunde*, xxxiii., xii., p. 353.

346. ELSCHNIG. **Cyclodialysis.** Meeting of the German Naturalists and Physicians at Salzburg, Sept., 1909.

347. KNAPP, A. **The operative treatment of glaucoma by cyclodialysis.** *Jour. Amer. Med. Assoc.*, Sept. 4, 1909.

348. MAHER, O. **On the treatment and prognosis of primary glaucoma.** *Ophthalmic Review*, July, 1909.

349. INGALLS, J. W. **Spontaneous rupture of the eyeball, with report of a case.** *Trans. Amer. Ophthalmol. Soc.*, 1909.

350. RÖNNE. **The form of the nasal defect in the visual field in glaucoma.** *Arch. f. Ophthalmologie*, lxxi., i., p. 52.

FRANK'S (342, **Primary hemorrhagic glaucoma with probable sympathetic inflammation**) puzzling case was a healthy man of 31 who, if his statement could be relied upon, was without previous warning suddenly attacked with acute glaucoma in his left eye. The eye was enucleated two months after upon the appearance of fine dots on Descemet's membrane of the right eye with loss of accommodation, hazy vitreous, and hyperæmic disk. The first eye had been punctured a number of times without relief and had passed into a state of chronic irido-cyclitis. The pathological examination did not show the lesions which are described by Fuchs and which are generally accepted as characteristic of sympathetic ophthalmia, but the author in spite of this is inclined to regard the affection of the second eye as such. It seems likely, however, that a low grade of inflammation must have existed in the left eye previous to the acute glaucoma and hemorrhages. ALLING.

JACKSON (343, **Recent observations concerning glaucoma**) illustrates various forms of glaucoma by relation of cases. He offers two explanations of the benefit which is derived from some of the operations done for glaucoma. Any operation that weakens the thickened ring of corneo-scleral tissue at the region of the limbus tends to permit an enlargement of the eyeball at the ciliary region by straightening out the re-entrant angle formed by the cornea and sclera. He further suggests that the formation of new vessels after operations about the root of the iris may re-establish connec-

tions between the anterior chamber of the eye and Schlemm's canal, causing a better venous channel of outflow.

ALLING.

FUKALA (344, **What is to be done when the anterior chamber is not reformed after an iridectomy for glaucoma?**) spoke of the sad cases of glaucoma in which the anterior chamber is not restored and the vision is thereby lost. He recommends to anæsthetize the eyeball and then to cauterize the wound throughout its entire extent with the electric cautery. This should be repeated every two or three days until the chamber is restored; from four to eight sittings are necessary. He has obtained excellent results from this procedure.

OHM (345, **Glaucoma and cyclodialysis**) reports several cases in which cyclodialysis was employed. He has never seen any harm result. On the contrary, two cases of glaucoma simplex were brought to a standstill immediately after the operation.

ELSCHNIG (346, **Cyclodialysis**) has tried cyclodialysis on 109 eyes and concludes from his experiences that the operation is one to be tried in simple and fresh inflammatory glaucoma. The results are fairly good. A discussion arises concerning the term "cured"; he thinks that it should mean that the tension became normal or subnormal without the use of miotics.

KNAPP (347, **The operative treatment of glaucoma by cyclodialysis**) has performed the operation of Heine eighteen times. It was a failure in one case of congenital glaucoma, in one of capsular adhesions to cornea, and in glaucoma secondary to vascular changes, but in fifteen cases of chronic glaucoma it was a partial success. In some of these an iridectomy had been previously performed without benefit, and in others, on account of the advanced stage of the process, no results could have been expected from iridectomy. In eleven for observation-periods from two months to over two years the tension was known to have been reduced. In four it became elevated again. There was a macular hemorrhage in one and attacks of acute glaucoma in two. No vitreous disturbances or detachment of the choroid were noted. Cyclodialysis seems to be of value in the advanced stages of chronic glaucoma especially when iridectomy has failed.

ALLING.

MAHER (348, **On the treatment and prognosis of primary glaucoma**). The author aims at a cystoid scar. He draws out a large loop of iris and allows the wound to heal before he excises the iris. He discusses the mechanism of iridectomy and attributes the theory that new channels for drainage are opened up because the cut iris never heals to Charbone. We were under the impression that this hypothesis was first advanced by T. Henderson of Nottingham whose able papers on the subject have recently been abstracted in this journal. As Maher gives no references to Charbone's paper we are unable to settle the question of priority, but, as far as our memory serves, Henderson does nor allude to this author as having suggested his research. Maher's method would seem to be a very clumsy and dangerous plan of attaining a filtering scar. In many cases an iris encleisis, even if it do not lead to septic infection, provides a bridge along which endothelial cells proliferate till they reach the iridic angle which they block and cause a glaucoma which is beyond treatment. Lagrange's and Herbert's methods are far preferable in every way. Most surgeons carefully avoid if possible any iris encleisis, which is recognized to be a potent cause of failure The author only recommends his operation for chronic cases. T. HARRISON BUTLER.

INGALLS (349, **Spontaneous rupture of the eyeball, with report of a case**) removed an eye from an old woman which had been in a state of absolute glaucoma. There was a history of intense pain about an hour before the eye ruptured. It was found that the hemorrhage was subchoroidal and that it was the cornea which ruptured. ALLING.

RÖNNE (350, **The form of the nasal defect in the visual field in glaucoma**) describes a nasal contraction of the visual field characteristic of glaucoma which runs vertically and advances by leaps. This symptom occurs together with Bjerrum's arcuate sector. He explains the phenomenon through the arcuate course of the fibres in the retina which are probably stretched in glaucoma.

XIX.—SYMPATHETIC OPHTHALMIA.

351. FEJER, J. **A cured case of sympathetic amblyopia.** *Centralbl. f. pract. Augenheilkunde*, xxxiii., 8, p. 237.

352. HEERFORDT, C. F. **The nature of sympathetic uveitis with a peculiar case of this disease.** *Hospitalstid.*, 1909, p. 89.

353. MELLER. **The origin of the sympathy-exciting infiltration of the uvea, with particular regard to its onset in an eye attacked by a sarcoma of the choroid.** *Wiener Ophthalm. Gesellschaft*, June 16, 1909.

354. AXENFELD, TH. **Sympathetic ophthalmia.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., Supplement, p. 113.

FEJER (351, **A cured case of sympathetic amblyopia**) reports a rare case that must be considered one of sympathetic irritation. Schirmer claims that only those are cases of sympathetic amblyopia in which other causes are absent and the amblyopia is associated with conditions of irritation of the other eye. In this case the conditions of irritation were severe inflammation, an eye as hard as a board, and chemosis. The vision of the left eye was $\frac{1}{10}$; the visual field was contracted. After the enucleation the vision rose in a few days to $\frac{6}{9}$. The envelope of the right eyeball was as hard as bone and shrunken; no trace of any injury could be found.

HEERFORDT (352, **The nature of sympathetic uveitis with a peculiar case of this disease**) assumes that sympathetic inflammation is caused by a specific microbe which acts by choice on the uvea, is found in the conjunctiva, and possesses great power of penetration. The period of incubation is fourteen days. An infection arises in cases in which the uvea has suffered a direct infection from without. As a rule, the other eye becomes infected from the uvea of the injured eye, but in some cases the infection may come directly from the site of the lesion, of from other mucous membranes. An infection taking place in the injured eye is highly pathogenic for the other eye, which becomes infected soon after the first. He urges therefore more accurate attention to the pathological conditions in the injured eye, especially to the presence of optic neuritis, which usually give rise to sympathetic ophthalmia. HELLGREN.

MELLER (353, **The origin of the sympathy-exciting infiltration of the uvea, with particular regard to its onset in an eye attacked by a sarcoma of the choroid**) speaks of the occurrence of sympathetic ophthalmia with sarcoma within the eye. The sympathy-exciting inflammation appears in

the uvea and is produced by a micro-organism similar to those of tuberculosis and syphilis. The inflammation may be accurately distinguished from that directly following injuries. It appears as though the sympathy-exciting agent is pathogenic only for the uvea. The sympathy exciting inflammation affects eyes in which the uvea has previously suffered injury, whether it be a necrosis through a tumor, or an endophthalmitis after traumatism. In such eyes the sympathy exciting inflammation appears sooner or later through endogenous infection. The author then speaks of the foci in the choroid along the vessels which are due to endogenous infection. He concludes that the sympathy exciting inflammation comes through endogenous infection which affects only a uvea that has previously been injured.

AXENFELD (354, **Sympathetic ophthalmia**). (1) Sympathetic detachment of the retina. He has observed one case in which the sympathetic ophthalmia began as a detachment of the retina. The course and the anatomical examination of the enucleated eye proved it to be a case of sympathetic disease. Later in the course vitreous opacities and the symptoms of a chronic, sero-plastic, fibrinous uveitis appeared. (2) Complete recovery of both the sympathy-exciting and the sympathetically diseased eye. A rare, but valuable case as regards prognosis. Both eyes were saved with perfect vision. The decision in favor of the operation is difficult, but such cases should not dissuade from it. (3) The localizing action of the sympathetic irritation. Schmidt-Rimpler has advanced the theory that relations are furnished by the vasomotor, sympathetic irritation of the other eye which favor the localization of the micro-organisms. The author considers this theory not yet contradicted and thinks that the experiments hitherto undertaken cannot be held as strongly evidential against it.

Sections XX.–XXII. Reviewed by Dr. H. MEYER, Brandenburg.

XX.—RETINA AND FUNCTIONAL DISTURBANCES.

355. LANGENHAN. **Glioma retinæ of the anterior segment of the globe, with perforation of the lens capsule and constriction of lens masses by tumor cells.** *Zeitschrift f. Augenheilkunde*, xxii., p. 135.

356. CALDERARO. **Photopsia in an individual deprived of his eyes.** *La Clinica Oculistica*, 1909, pp. 3501 and 3512.

357. DEUTSCHMANN, R. **On the treatment of detachment of the retina.** *Ophthalmoscope*, Nov., 1909.

358. ZENTMAYER, W. **Hole in the macula. Report of two cases.** *Annals of Ophthalmology*, July, 1909.

359. PERROD. **Pathological studies concerning pigmentation of the retina.** *Annali di oftalmologia*, 1908, fasc. 7, 8, 9, pp. 671–698.

360. BEAL, RAYMOND. **Retinal hemorrage, retinal œdema, and optic atrophy from compression of the thorax and neck.** *Annales d'oculistique*, cxlii., p. 89.

361. TSCHIRKOWSKY. **Thrombosis of the central vein of the retina with subsequent glaucoma, together with some remarks concerning the pathogenesis of retinitis proliferans.** *Westn. Ophth.*, 1909, No. 9.

362. MELLER. **Embolism of a cilio-retinal artery.** *Arch. f. Ophthalm.*, lxxii., 3, p. 436.

363. BALLANTYNE, A. J. **Transient convulsions in two children with unusual changes in the fundus oculi.** *Ophthalmoscope*, Oct., 1909.

LANGENHAN (355, **Glioma retinæ of the anterior segment of the globe, with perforation of the lens capsule and constriction of lens masses by tumor cells**) describes a case of glioma retinæ in which, as rarely happens, the tumor developed in the anterior segment of the globe. Marked effects produced on the lens were as follows: Dislocation, deformation caused by the tension and pressure, emulsion-like destruction of the lens fibres, reactive proliferation of the epithelium of the capsule, rupture of the capsule from over-tension, snaring off of portions of the lens by wedge-shaped masses of glioma cells between the fibres of the lens, conical penetration of the tumor into the posterior pole of the lens.

CALDERARO'S (356, **Photopsia in an individual deprived of his eyes**) man had irritative glaucoma in his right eye six years before, with retinitis pigmentosa, which soon resulted in blindness. Glaucomatous attacks appeared in the left eye, and the patient began to perceive in this eye photopsias and chromatopsias in the form of small bright crescents and sparks occupying the entire left side of the field. These sensations were persistent and continuous, and in order to free himself of them the patient had his right eye exenterated but without effect. The atrophic stump was then enucleated with over 1*cm* of the optic nerve. As the left eye was blind and painful and the photopsias persisted in it the patient had

this eye removed, but the photopsia persisted the same as before. Calderaro now opened the conjunctival sac on this side, laid bare the optic nerve, and made chemical, mechanical, and electrical applications. Yet this did not succeed in producing any modification of the photopsia which persisted even after the stump of the optic nerve had been excised as far back as the foramen. The two stumps of the optic nerves showed under the microscope absolute atrophy of all nerve fibres in the left, and an advanced atrophy with preservation of a fair number of fibres in an almost normal condition in the right. In neither was there any sign of cicatricial compression or of phlogosis. Therefore the author concludes that the cause of the photopsia in this case was probably cortical. CALDERARO.

DEUTSCHMANN (357, **On the treatment of detachment of the retina**) read a paper on his method of treating detached retina to the Oxford Congress in July, 1909. As is well known he uses two methods: Bisection for ordinary cases, and for those otherwise hopeless the injection of sterile vitreous humor of certain animals.

The technique was described in the *Ophthalmoscope*, vol. v., No. 8. The best figures published so far are those of Horstmann with 6.6% of cures, and Uhthoff with 7.5%. Deutschmann has completed the treatment in 267 cases. 26.1% were cured, 35.2% improved, 38.7% uninfluenced. 15.5% had myopia of $\frac{1}{8}$ D.; 14.4% $\frac{1}{12}$ D.; 16.1% 13 D. and more. 12.1% were emmetropic, and 2.3% hypermetropic. Deutschmann laid down 10 rules for the safe performance of the operation, but all his descriptions are difficult to follow.

T. HARRISON BUTLER.

The first case of ZENTMAYER'S (358, **Hole in the macula**) followed a blow upon the eye and showed a glaucomatous cup and a sharply defined circular area in the macula. The other case gave no history of injury, but the macula showed a round, dark, depressed spot about one third of the disk in diameter. ALLING.

PERROD'S (359, **Pathological studies concerning pigmentation of the retina**) conclusions are: (1) The fate of the retinal pigment which accidentally gets into the vitreous, whether it is enclosed in cells or in the form of cell detritus coming from

the destruction of the cells of the pigment epithelium, is its excretion. (2) The pigment which in a chosen form gets into the vitreous is excreted as a foreign body through the nearest lymph tracts. Such lymph tracts are: (*a*) the space between the vitreous membrane and the retina; (*b*) the perivascular sheaths in the optic nerve and (*c*) the retinal vessels. (3) Even when the pigment comes into the retina by crossing through its outermost layers (retinitis pigmentosa, atrophy of the retina, chorio-retinitis) the modality of the process may be considered as analogous; in consequence of the destruction of the rods and cones the pigment epithelium, because it has lost its physiological importance, is eliminated through the nearest lymph channels. This elimination is partly through the amœboid movements of the cells and through their re-awakened phagocytic activity. (4) Although the experimentally determined facts attribute the excretory function of the metabolic products of the vitreous only to the central canal of the vitreous and the perivascular spaces of the optic nerve, the pathological symptoms suggest that the perivascular spaces of the retinal vessels and capillaries possess a certain importance in this phenomenon. The determination whether and how far an alteration of these spaces may contribute to the production of symptoms of hypertension by the endocular fluids remains for future study. CALDERARO.

BEAL (360, **Retinal hemorrhage, retinal œdema, and optic atrophy from compression of the thorax and neck**) observed the following symptoms in a boy of 14 who had suffered severe compression of his neck and chest: (1) Bilateral subconjunctival ecchymoses of the bulbar conjunctiva in the palpebral space. (2) Temporary blindness of the left eye. (3) Paramacular hemorrhage. (4) Retinal œdema with subretinal effusions in the zones of the retina about the macula and papilla. (5) Subsequent optic atrophy in the right eye, which was the one that presented the symptoms 3 and 4. BERGER.

TSCHIRKOWSKY (361, **Thrombosis of the central vein of the retina with subsequent glaucoma, together with some remarks concerning the pathogenesis of retinitis proliferans**) observed a case of hemorrhagic glaucoma, the result of a preceding thrombosis of the central vein of the retina, which led to enucleation. The microscopic examination revealed

the typical condition of glaucomatous eyes. Throughout the entire fundus were scattered large preretinal, old and fresh effusions of blood; in the retina itself were only few and circumscribed extravasations in the layer of nerve fibres and ganglion cells. Both of the latter retinal layers were markedly atrophied, while the other layers were well preserved, except that at the posterior pole and round about the papilla considerable changes were present in all the layers of the retina: manifold thickening of the retina, change of position of the layers, œdema of the retina, cystoid changes. The retinal vessels showed in different degrees marked symptoms of arteritis and phlebitis, chiefly in the form of perivasculitis, with, in some places, occlusion of the vessel by thickening of the walls, in other places narrowing of the lumen by proliferation in the intima; hypertrophy of the supporting fibres of the retina. The lumen of the upper branch of the central vein of the retina was completely occluded by a cellular mass immediately behind the lamina (thrombus). The other branch was not completely occluded, but had a free capillary space through which one or two blood corpuscles could pass. The writer gives an analysis of the literature on the subject and arranges the following succession of pathological changes-symptoms as they probably took place in his case: endophlebitis and periphlebitis of the central vein of the retina, thrombus formation to almost complete occlusion of its lumen; numerous hemorrhages at different times in consequence of the thrombus and the general vascular disease in the eye; glaucoma in consequence of the hemorrhages, the vascular changes, and chiefly the closure of the anterior chamber. The proliferation of connective tissue in the vitreous he believes to have been the beginning of a retinitis proliferans, induced by the preceding extravasations. He considers retinitis proliferans to be a process not pathologically independent, and to come from different causes.

HIRSCHMANN.

MELLER (362, **Embolism of a cilio-retinal artery**) observed a case of occlusion of a cilio-retinal artery. This case forms an interesting counterpart to those cases of embolism of the central artery in which because of the presence of a cilio-retinal artery the portion of the retina supplied by the latter

remains preserved. No cardiac trouble was present. There was an absolute central scotoma in the field of vision. After a month of massage the vision had improved to $\frac{1}{4}$.

BALLANTYNE (363, **Transient convulsions in two children with unusual changes in the fundus oculi**). In the first case the disk was pale and vessels narrow. Dotted over the fundus were six or eight small masses of pigment, some superficial to the retinal vessels. At the extreme periphery were a number of pale spots probably due to choroidal atrophy. There was some periphlebitis. There had evidently been a chorio-retinitis of moderate degree. There was no periarteritis. The child had headaches with swelling of legs and face. On admission had several convulsions. Urine contained a little albumen. No casts.

In the second case the left eye was normal. In the right a number of white spots were scattered over the upper part of the fundus. A few near the disk. They had a pure white color, almost glistening. They were in the retina, some superficial to the vessels. At one spot peripherally situated the retina was opaque and there was some periphlebitis. V. = $\frac{6}{6}$ in each eye. The child had vomiting and convulsions; there was a trace of albumen in the urine. Slight general œdema. The condition of the fundus did not present much resemblance to albuminuric retinitis, the albuminuria was trifling, and there was no evidence of organic kidney disease. All known forms of retinitis could be excluded.

T. HARRISON BUTLER.

XXI.—OPTIC NERVE.

364. SHUMWAY, E. A. **Optic atrophy in syringo-myelia. Congenital cataract with unusual atrophy of the iris from secondary glaucoma.** *Annals of Ophthalmology*, July, 1909.

365. LAUBER, H. **Clinical and anatomical studies concerning hole-like partial colobomata of the optic nerve.** *Zeitsch. f. Augenh.*, xxi., p. 494.

366. BEHR. **Complicated hereditary family optic atrophy of infants.** *Klin. Monatsbl. f. Augenheilkunde*, xlvii., ii., 2, p. 138.

367. RUSSELL, J. S. RISIEN. **The significance of optic neuritis.** *Ophthalmoscope*, Sept., 1909.

368. GIBSON, J. L. **Plumbic ocular neuritis in Queensland children.** *British Medical Journal*, Nov. 14, 1909.

369. CASALI. **Lymphango-endothelioma of the optic nerve.** *Annali di otialmologia*, 1909, fasc. 6–7.

370. HÖEG, N. **Some cases of injury of the optic nerve.** *Hospitalstid*, 1909, p. 501.

The case of SHUMWAY (364, **Optic atrophy in syringomyelia. Congenital cataract with unusual atrophy of the iris from secondary glaucoma**) is of interest on account of the optic atrophy which is uncommon in this disease and is usually due to internal hydrocephalus, meningitis, or increased cranial pressure. This seems best explained by assigning the former of these as the cause. ALLING.

LAUBER (365, **Clinical and anatomical studies concerning holelike partial colobomata of the optic nerve**) concludes from the clinical and anatomical examination of five new cases of partial coloboma of the optic nerve that the circumscribed gray spot in the optic papilla represents a partial coloboma. Its color depends on contrast and shadows, not on pigment. It is sometimes associated with conus below and is nearly related to this malformation. It causes among other things a paracentral scotoma and a peripheral contraction of the field. In explanation of the scotoma the author says that it cannot be told whether there is not a formation of nerve fibres in the affected area of the retina, thus producing an aplasia of these elements, or whether the already formed nerve fibres die out. The question whether there is a primary disease of the nerve fibres or ganglion cells in the optic atrophy of tabes has been answered by Rönne that there is doubtless a primary disease of the optic fibres, for there is a marked similarity that has hitherto been noticed too little between the visual field of this disease and that of glaucoma, *i.e.*, the limit of the visual field of atrophy along the nasal horizontal meridian.

BEHR (366, **Complicated hereditary family optic atrophy of infants**) has observed the following symptom-complex in six patients: During the first year of life, possibly also congenitally, appears a quite characteristic complex which agrees perfectly, so far as the fundus conditions are concerned, with the family optic atrophy of Leber, but presents in addition slight disturbances on the part of the pyramidal tract (hypertony and increased reflex), on the part of the co-ordination (ataxia and uncertain walk), disturbances of the

bladder and a little mental inferiority. The eye changes form the most prominent part of the clinical picture. This condition remains perfectly stationary for many years and up to the present time has been met with only in boys. In order to emphasize at once the individuality of this symptom-complex and its relationship to family atrophy he suggests that it be named "The complicated infantile family optic atrophy," while Leber's form be called "The uncomplicated juvenile family optic atrophy."

RUSSELL (367, **The significance of optic neuritis**). The reader of the paper dealt with those cases where optic neuritis is certainly detected, but all other symptoms are so vague that it is almost impossible to account for its presence. Perhaps slight headache is the only symptom accompanying the neuritis. We cannot yet distinguish between a neuritis caused by pressure, and one due to a toxæmia. Russell has seen only one case in which anæmia seemed to be the cause. Perhaps the anæmia and the neuritis are both caused by toxæmia, or there may be a sinus thrombosis. The fact that one or more of the eye muscles may be paralyzed lends support to this theory. Optic neuritis does not in Russell's experience complicate insular sclerosis, there may be a retro-bulbar neuritis. Serous meningitis should be thought of. The author agrees with Horsley in thinking that the optic neuritis is more severe on the side on which a tumor exists, and in advising early decompression to save sight.

T. HARRISON BUTLER.

GIBSON (368, **Plumbic ocular neuritis in Queensland children**). Queensland children are frequently attacked by lead poisoning; they play about on the verandas and garden railings and then bite their nails or suck their fingers. The paint used is a lead carbonate. After exposure to the weather for a year or two it gets powdery.

The disease has a sudden onset with or without preliminary colic, vomiting, and constipation, and with or without severe headache, rigidity of the neck, and retracted head. There may be paralysis of one or both external recti with optic neuritis, unaccompanied by rise of temperature or albuminuria. There is the well-known blue line, and lead can be detected in the urine. The acute ocular cases are confined to children of

two to eight years old. Many older children are found in blind asylums suffering from post-neuritic atrophy. Ocular symptoms follow but do not accompany wrist-drop. The optic neuritis is severe, 5–6 dioptres. It has never been seen apart from some paraplegia externa. Sight remains good for a time in spite of the intense neuritis. Later on diminished acuity with concentric contraction of the fields. No color scotoma is found.

Treatment consists in removal from source of poisoning, dilute sulphuric acid and saline laxatives with daily hypodermics of pilocarpin. Then potassium iodide in five-grain doses. In cases with encephalopathy repeated lumbar puncture has been of service.

T. HARRISON BUTLER.

CASALI (369, **Lymphango-endothelioma of the optic nerve**) reports the following case. A girl 9 years old with nothing of note in her family or personal history had exophthalmos of her left eye directly forward about *12mm.* It was irreducible and had been noticed for three years. All movements of the eyeball were possible, but limited. The papilla was œdematous and enormously enlarged. Vision was fingers at *80cm.* The diagnosis of tumor of the optic nerve was made. Some months later the eye was enucleated and a tumor removed which showed under the microscope the typical peculiarities of a lymphango-endothelioma and exhibited some points of interest in its extension to the motor muscles and the eyeball. The girl recovered and showed no signs of recurrence nine months later. The author thinks that the tumor started from the lymph spaces of the outer layers of the dural sheath. CALDERARO.

HÖEG (370, **Some cases of injury of the optic nerve**) reports three cases in which a contusion of the eye without causing anything more than an insignificant external lesion produced a rupture of the nerve fibres, in one case in the retina round about the papilla, in the other two just behind the entrance of the central vessels into the optic nerve. HELLGREN.

XXII.—INJURIES, FOREIGN BODIES, PARASITES.

371. FOX, L. WEBSTER. **Conservative survey in ocular injuries.** *Ophthalmic Record*, Nov., 1909.

372. WILLIAMS C. **A case of avulsion bulbi.** *Annals of Ophth.*, July, 1909.

373. TERENTJEW, A. F. **Some ophthalmological observations.** *Wojenno Med. Journal*, Oct., 1909.

374. MARX, G. **Injury of the lens by a piece of iron without traumatic cataract.** *Klin. Monatsbl. f. Augenheilk.*, xlvii., ii., 2, p. 178.

FOX'S (371, **Conservative surgery in ocular injuries**) conception of conservatism is shown in the relation of the following cases: (1) A splinter of wood one-half inch long removed from the orbit. (2) Removal after twenty-three years of a piece of metal one-eighth of an inch above the right eyebrow. He was surprised not to have found siderosis of the eye. (3) Perforating wound of the sclera an eighth of an inch long with sutures to close the conjunctival wound. Recovery. (4) Perforating wound of the cornea and sclera. Suture. Recovery. (5) Rupture of the sclera three-quarters of an inch long, downwards and outwards from the cornea. Enucleation. Fox thinks that incised wounds which perforate between the ciliary processes have little or no tendency to cause trouble. He closes the paper with a plea for Mules's operation. ALLING.

WILLIAMS'S (372, **A case of avulsion bulbi**) patient ran into the end of an iron pipe and enucleated his eye so completely that it hung upon the cheek by the external rectus alone. The optic nerve was severed about *7mm* behind the ball. ALLING.

TERENTJEW (373, **Some ophthalmological observations**) reports the following: (1) A lash adherent to the anterior capsule. The lash had been implanted in the anterior chamber fourteen years before by a stab wound that healed of itself, leaving a peripheral leucoma adherens. The blond cilium was attached by its thick end to the anterior capsule and was immovable. No signs of reaction. Vision $\frac{9}{200}$. (2) A foreign body in the cornea. A piece of metal in the cornea for three years causing repeated inflammations. After remova' an opacity was left. The function of the eye was not interfered with. (3) A piece of glass *16mm* long, *6mm* broad, and *2mm* thick in the orbit for fourteen months without signs of reaction. Removed by operation. (4) Pathological symptoms in the eye of a soldier 21 years old, consequent

upon a past meningitis in childhood: incomplete ophthalmoplegia of the right eye, paresis of the sympathetic (ptosis and miosis). The internal rectus and the intrinsic muscles of the eye functionated normally. The right eye was the smaller, soft, with incomplete optic atrophy. Hypermetropia 5. D. Vision $\frac{5}{200}$. HIRSCHMANN.

In the case reported by MARX (374, **Injury of the lens by a piece of iron without traumatic cataract**) the presence of a piece of iron in the lens was diagnosed two days after the injury. The eye was severely inflamed. At the place of entrance of the foreign body into the lens was a posterior synechia and a bit of pus. The fragment was withdrawn with Volkmann's magnet through the wound of entrance. On the day after the extraction the former site of the foreign body was visible as a delicate gray cloudiness, which could no longer be seen after the lapse of another twenty-four hours. Fourteen years after the injury the lens was still clear and only an irregular refraction could be detected at the place formerly occupied by the foreign body. Marx explains this rare result as due to an abnormally rapid closure of the wound in the capsule.

Section XXIII. Reviewed by Dr. CLAUSEN, Berlin.

XXIII.—OCULAR LESIONS IN GENERAL DISEASES.

375. BULL, C. S. **The adverse influence of diabetes in certain operations on the eye.** *Trans. Amer. Ophthalm. Soc.*, 1909.

376. WELTON, C. B. **Eye symptoms of pellagra.** *Jour. A.M.A.*, Nov. 13, 1909.

377. WHALEY, E. M. **The ocular symptoms of pellagra.** *Oph. Rec.*, Nov., 1909.

378. BRUNER, W. E. **Ocular manifestations of arterio-sclerosis.** *Annals of Ophthalmology*, Oct., 1909.

379. HEVEROCH. **Stere-hemiedysmetresis.** *Internat. Med. Congress* at Budapest, 1909.

BULL (375, **The adverse influence of diabetes in certain operations on the eye**) insists that it is not the amount of sugar nor even its presence which is of the greatest importance in influencing operative results but rather the finding of acetone, diacetic acid, and beta-oxy-butyric acid. The complications which he has observed have been either iritis, hemorrhages into the anterior chamber, or slow healing due to in-

fection. He draws his conclusions from analysis of 115 cases of various operations upon diabetic patients. There were 62 cataract extractions, 40 of which were senile in diabetic patients over 65 years of age, and there were no serious results. The remaining 22 were pure diabetic cataracts in younger patients. In six there was profuse hemorrhage into the anterior chamber, two retinal hemorrhages, six obstinate iritis, eight no complications. In 40 cases of preliminary iridectomy in cataract cases 20 were senile, 15 true diabetic. In the former there were three hemorrhages, in the latter iritis four times. In nine iridectomies for optical purposes there were no complications except once iritis. In four iridectomies for chronic glaucoma all did badly from hemorrhage. He believes that arterio-sclerosis plays an important rôle in the etiology of the disease and its complications.

ALLING.

An ocular examination of 55 insane patients by WELTON (376, **Eye symptoms of pellagra**) showed changes in the lens in 12% of the patients whose average age was 52, confirming the theory of the metabolic nature of pellagra which would produce an altered nutrition of the lens. Optic neuritis and retinitis were found in five and ten per cent. of cases respectively. But the most pronounced and frequent change was choroiditis. None of the eye changes could be considered pathognomonic of pellagra. The severity of the eye lesions corresponds to the severity of the general symptoms.

ALLING.

WHALEY (377, **The ocular symptoms of pellagra**) reports the eye examination of thirty-five cases of this disease. The only characteristic symptom he describes, rather vaguely, as a thickening of the retina, giving an indistinct yellowish color. Many cases show also ptosis, which he ascribes to photophobia. Some have mydriasis, others myosis. Various other affections are enumerated which may or may not be due to the disease itself. ALLING.

BRUNER'S (378, **Ocular manifestations of arterio-sclerosis**) paper is an excellent statement of the value of ophthalmoscopy in the diagnosis of arterio-sclerosis. He gives the histories of twenty cases which illustrate the various phases of this disease. ALLING.

HEVEROCH (379, **Stere-hemiedysmetresis**) saw within three months two patients who presented the same symptoms after a railroad accident. In both the measurement of space by the eye or the touch appeared to be smaller on the right side. He is unable to find such cases described in literature. These patients estimated space erroneously with their eyes only in the right half of the field; objects seemed smaller to them when felt of with the right hand. In each there was a certain disturbance of a psychical function: a disturbance of the power of measurement. The site of this disturbance must be transcortical. From Greek words meaning unilateral false measurement Heveroch forms the term sterehemiedysmetris which he suggests as a proper name for this condition.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST AND SECOND QUARTERS OF THE YEAR 1910.

Translated by Dr. MATTHIAS LANCKTON FOSTER.

Sections I.–III. Reviewed by Prof. C. HORSTMANN, Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

1. GREENE, D. W. **A brief historic sketch of Jacques Daviel and his work, suggested by a visit to his grave.** *Ophthalmic Record*, June, 1910.
2. DUFOUR, M. **Milton's blindness.** *Ophthalmoscope*, Sept., 1909.
3. MACCALLAN, A. F. **The relief of eye disease in Egypt.** *Ophthalmoscope*, Oct., 1909.
4. BERGER, E. **Charts for the estimation of the central vision of weak-sighted eyes.** J. F. Bergmann, Wiesbaden, 1910.
5. KANZEL. **Statistics of serious injuries of the eyes.** *Petersburger med. Wochenschrift*, 1910, No. 6.

GREENE (1, **A brief historic sketch of Jacques Daviel and his work, suggested by a visit to his grave**) gives a short sketch of Daviel's work and accords him the position of the first man to perform the extraction of cataract by incision through the cornea. BLAKE.

DUFOUR, M. (2, **Milton's blindness**). A Latin letter written by Milton to Philaras, a Greek diplomat living in Paris, gives us the most authentic information on the state of the poet's eyesight. Milton noticed that his sight was failing and saw a halo round flames. He then noticed a shadow on the left side of the left eye which gradually spread till the eye was blind. Later the right eye slowly grew dim. Even when blind he was troubled with a brilliant light which shone before his closed eye. The external appearance of the eyes was normal.

In 1654 Milton writes to his friend Syriac Skinner:

"Syriac, this three years day these eyes though clear,
To outward view, of blemish or of spot,
Bereft of light their seeing have forgot,
Nor to their idle orbs doth light appear
Of sun, or moon, or star throughout the year,
Or man, or woman."

Milton devoted himself to increase his store of knowledge, working daily till midnight, and who knows with what light? Although he travelled much in Europe, including Switzerland, there is not in all his works a line devoted to the beauties of nature. Dufour concludes that Milton's blindness was caused by detachment of the retinæ following progressive myopia. T. HARRISON BUTLER.

MACCALLAN (3, **The relief of eye disease in Egypt**) gives an account of the prevalence of eye disease in Egypt. Official figures, which for various reasons must be taken with reserve and underestimate the true number of the blind and partially blind, show that among 11,000,000 persons more than half a million are blind in one or both eyes. Trachoma is practically universal among the middle and lower classes. Thus in the Government Primary School at Tanta 99.43% of the scholars were afflicted with some form of conjunctivitis. Among 18,239 patients seen at the ophthalmic hospitals 6,439 were afflicted with trichiasis. Blindness is at least 53 times as common in Egypt as in the United States.

A sketch is given of the work done by the travelling ophthalmic hospitals and of the permanent base hospitals which have recently been opened. The author divides trachoma into four stages.

T. HARRISON BUTLER.

BERGER (4, **Charts for the estimation of the central vision of weak-sighted eyes**) uses optotypes which by means of the stereoscope permit vision of both eyes at the same time, so that by the fixation of the better eye the worse one is fixed as accurately as possible in a position corresponding to the line of vision. The black squares on a white background serve for the examination of the vision of the poorer eye, the better eye being fixed on a point above the squares, or on the square itself. The squares are so drawn that with parallel

visual lines a checker-board figure will appear to be formed by the union of the two images.

According to KANZEL (5, **Statistics of serious injuries of the eyes**) 81% of all injuries to the eyes occur during work and consist chiefly of wounds with fragments of iron, steel, and copper. The injured eye is lost in 15% of all cases, good vision is preserved in 38.8%. Wounds through blunt traumatism give on the average worse results, and the same is true when the lens is injured.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND TREATMENT.

6. SEMPLE, N. M. **The relation of the general blood pressure to the pathogenesis of certain ophthalmic diseases.** *Amer. Jour. of Ophth.*, Jan., 1910.

7. HARRIS, C. M. **Metastatic panophthalmitis with report of two cases.** *Ophthalmology*, April, 1910.

8. KERRY, RICHARD. **Five cases of tuberculosis of and about the eye.** *Ophthalmology*, April, 1910.

9. ZADE, MARTIN. **Studies concerning immunizatory, especially phagocytic, processes in the eye.** *Arch. f. Ophthalm.*, lxxv., i., p. 43.

10. IGERSHEIM, J., and RUBEN, L. **Morphology and pathogenesis of the naphthalin changes in the eye.** *Arch. f. Ophthalm.*, lxxiv., p. 467.

11. SCHOMBURG, L. **The question of the diminution of the growth of the eye after iridectomy in early life.** *Muenchener med. Woch.*, 1910, 19.

12. STASINSKI. **A case of temporary quinine amaurosis or amblyopia.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., i., 1, p. 177.

13. CORDS, R. **Experimental and clinical experiences concerning the nature of the action of scarlet red in corneal diseases.** *Ibid.*, p. 1.

14. JUSELIUS, EMIL. **Experimental studies concerning the regeneration of the epithelium of the cornea under normal conditions and under therapeutic measures.** *Arch. f. Ophthalm.*, lxxv., 2, p. 250.

15. SCHNEIDER, R. **Experimental studies concerning the importance of leucine in the healing of infectious conjunctivitis.** *Ibid.*, lxxiii, p. 223.

16. LAFON, CHARLES. **Cytologic and microchirurgic examination of conjunctival secretions and its clinical use.** *Annal. d' Ocul.*, cxliii., p. 321.

17. LAZAREW, E. G. **The paraspecific serum therapy in ophthalmology.** *West. Ophthalm.*, No. 12, 1909.

18. HERTEL. **Effects and actions of subconjunctival injections of salt.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., Supplement, p. 75.

19. ADAM. **The value of dionin treatment in diseases of the eye.** *Muenchener med. Wochenschrift*, 1910, p. 358.

20. LANGENHAN. **Contributions to ophthalmo-tonometry.** *Zeitschrift f. Augenheilkunde*, xxiii., p. 201.

21. LOEHLEN, WALTER. **Valuation of optic-ciliary resection. Clinical and anatomical conditions.** *Arch. f. Ophtalm.*, lxxv., ii., p. 291.

22. BEST, E. **Injury to the eye by ultraviolet rays.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., i., 3, p. 341.
23. BEST. **Is protection of the eyes against ultraviolet light necessary?** *Medizinische Klinik*, 1910, p. 256.
24. KROTOW, A. G. **Hallauer's protective glasses.** *Westn. Ophthalm.*, 1909, No. 12.

SEMPLE (6, **The relation of the general blood pressure to the pathogenesis of certain ophthalmic diseases**) discusses the theoretical considerations of this subject and reports three cases in which the reduction of arterial tension seemed to bring about an improvement: a case of chronic glaucoma with retinal hemorrhages, a case of retinal hemorrhages, with arterio-sclerosis, and a case in which attacks of obscuration of vision resembled ophthalmic migraine. ALLING.

In the first case of HARRIS (7, **Metastatic panophthalmitis with report of two cases**), the patient had a perinephritic abscess which terminated fatally. The second case was a pregnant woman who had miscarried. Puerperal sepsis was suspected but clinically and bacteriologically could not be proved. The patient recovered with phthisical eyes.
BLAKE.

KERRY (8, **Five cases of tuberculosis of and about the eye**) reports upon the use of hypodermic injections of a mixture of 20% iodoform in paraffin oil and one per cent. of carbolic acid. Four grains are given at a dose. One case of tuberculosis of the lachrymal sacs was cured in three months. One case of tuberculous keratitis and iritis went on to phthisis and enucleation. Three cases of tuberculous keratitis in two of which the iris was involved were cured. He recommends a further trial of the method. BLAKE.

The lachrymal fluid contains, according to ZADE (9, **Studies concerning immunizatory, especially phagocytic, processes in the eye**), neither bactericide substances nor opsonins. The aqueous of normal, non-irritated eyes contains no bactericide material and no opsonin. After an evacuation of the aqueous, the aqueous that replaces it contains bactericide and opsonic power. Likewise opsonin is present in the anterior chamber in various conditions of irritation of the eye. The accumulation of opsonins induced by irritation is quantitatively much behind the opsonic power of the blood serum. Irritation with dionin

induces a less opsonic effect in the aqueous than subconjunctival injections of salt. The death of pneumococci in the peritoneal cavity of guinea-pigs and in the vitreous of rabbits can be brought about by bacteriolysis alone without demonstrable phagocytosis. In two surely active immune serums a bacteriotrope action could be determined neither in the bodies of animals, nor in the test-tube. The opsonins appearing after injections into the cornea and vitreous are not specific.

According to IGERSHEIM and RUBEN (10, **Morphology and pathogenesis of the naphthalin changes in the eye**) derivates of naphthalin may pass into the eye and produce local changes there. The weaker changes consist of degenerative processes in the retina without a marked disturbance of the circulation or the vessel walls being demonstrable. The arrangement of the changes in patches depends evidently on the fact that only small quantities of the poison are present in the different places in the retina. When there is a greater quantity of the toxic substance in the retina the changes are greater, produced by processes resembling inflammation accompanied by exudation. As the author found α-naphthol in the aqueous but not in the lens it appears that the toxic substance does not pass over into the lens; this accords with Hess's theory that cataract arises from the injury to the epithelium of the anterior capsule.

The check of the growth of the eye operated on, observed in animals after an iridectomy by Wessely, apparently does not take place in man according to SCHOMBURG (11, **The question of the diminution of the growth of the eye after iridectomy in early life**). In two cases in which an iridectomy had been done in the eighth month of life there was no diminution of the size of the eyes that had been operated on, when the children were 7 years old.

After a single dose of about 4*gm* quinine taken by a woman 60 years old, STASINSKI (12, **A case of temporary quinine amaurosis or amblyopia**) observed a total amaurosis which improved at the end of nine hours; total color blindness persisted for three or four days. At the end of eight days the vision had risen a third and ten days later it was completely restored. The retina was cloudy, of a dull, grayish

white appearance, and the retinal vessels appeared thread-like.

According to the experiments and clinical observations of CORDS (13, **Experimental and clinical experiences concerning the nature of the action of scarlet red in corneal diseases**) scarlet red in a 5 to 10% ointment induces an accelerated regeneration of the stroma of the cornea, or scar formation. A stronger proliferation of the corneal epithelium does not take place. It produces no antiseptic effect. The indications for its use in corneal diseases are very limited. It is of use only in clean ulcers, particularly when these have left behind keratoceles, small prolapses of the iris, or fistulæ.

The normal regeneration of the cornea takes place according to JUSELIUS (14, **Experimental studies concerning the regeneration of the epithelium of the cornea under normal conditions and under therapeutic measures**) in the following manner. After the removal of a portion of the epithelium from the centre of the cornea a mitotic division begins at the corneo-scleral margin and reaches the defect at the end of two hours. After the lapse of from eight to twelve hours karyokinesis is no longer present in the periphery of the cornea. The true regeneration of the defect commences four hours after the injury in the cells at the margin. A passive gliding, or shoving of the original epithelium from the margin into the defect, is not present. Cocaine hydrochlorate, even in weak solutions, exerts an inhibitive action upon the regeneration, concentrated solutions do harm, subconjunctival injections of 2% salt solutions accelerate the regeneration somewhat, while the 4%, and still more the 6% solutions, act inhibitively or cause direct injury. A 1:1000 sublimate solution injected subconjunctivally acts like the 2% solution of salt, a 1:2000 solution does direct harm. Dionin instilled in a 10% solution produces some acceleration. Heat and moist heat accelerate the regeneration of the epithelium, while cold, in the form of ice-cloths, has an inhibitive effect.

According to SCHNEIDER (15, **Experimental studies concerning the importance of leucine in the healing of infectious conjunctivitis**) the normal secretion of the lachrymal glands and conjunctiva contains no bactericide, hæmolytic, or opsonic substances. After instillation of solutions of silver nitrate,

protargol, and zinc sulphate, leucocytes migrate into the conjunctival sac and yield, under the influence of these substances, their bactericide material, leucine. The curative action of astringents depends not so much on the formation of crusts and membranes caused by them, or on their antiseptic power, as on their capacity to call forth the formation of leucine. The destruction of the infectious germs is produced extracellularly for the most part in the conjunctival secretion by the leucine contained in it and not by alexin, which is ineffective to most exciters of conjunctivitis and escapes from the blood only in small quantities after the application of salts of silver or zinc. Even if the entrance of leucine into the conjunctival fluid is the true agent upon which rests the curative effect of silver nitrate and zinc sulphate it cannot be said that the therapeutic functions of these salts are exhausted with the formation of leucine and crusts and their slight antiseptic action. For as unknown provisions for the defence of the organism may exist together with those that are known, it is quite possible that silver nitrate and zinc sulphate may exert still other influences upon the tissue. The fact that the local effect of astringents in increasing the power of resistance and promoting recovery is chiefly due to the formation of leucine, is an evidence that leucine may be classed correctly with the alexin of the blood and phagocytosis as an important weapon in the natural resistance. In the treatment of infectious diseases of the conjunctiva the indication is to combat the agent of infection by a rich production of leucine.

Lafon (16, **Cytologic and microchirurgic examination of conjunctival secretions and its clinical use**) has studied the cytologic and microchemic nature of the conjunctival secretion both in the normal condition and in various diseases, and finds in the individual diseases of the conjunctiva quite characteristic proportions of the individual cellular elements. Thus he finds in purulent conjunctivitis the polynucleated cells to be 98%, the lymphocytes to be 1%, and the epithelial cells to be 1%; in toxic conjunctivitis the polynucleated cells to be 97% and the lymphocytes 3%; in subacute conjunctivitis the polynucleated cells to be from 69 to 77%, etc. The great number of eosinophile cells in the conjunctival

secretion in vernal catarrh was noticed first by Axenfeld. Lafon claims that in doubtful cases the cytologic examination of the conjunctival secretion may be able to make the diagnosis positive. Extraction of cataract should be performed only when the polynucleated cells occupy less than a fifth of the field in the microscope. He considers extirpation of the lachrymal sac to be insufficient as a protection against infection of the wound when disease of the lachrymal passages is present. BERGER.

LAZAREW (17, **The paraspecific serum therapy in ophthalmology**) reviews the literature on this subject and gives his own personal observations. He used antidiphtheritic serum in one case of phlegmon of the orbit (streptococcus infection with suppuration from a fistula that extended into the ethmoid), in two cases of suppuration of the cornea after cataract extraction, in nine cases of ulcus corneæ serpens, and abscess of the cornea (in five cases pneumococcus infection, in three infection with staphylococcus aureus and albus), in three cases of plastic iritis, and in two cases of chronic irido-cyclitis. From 1000 to 2000 units of the serum were injected subcutaneously from one to three times. His conclusions, which are drawn with great care, are that in ulcus corneæ serpens the injections of serum resulted in a shortening of the duration of the disease, as compared with the results of the usual methods of treatment, and in a reduction of the pain. In phlegmon of the orbit and in recurrent hordeola the injections of serum are to be strongly recommended. Likewise they lessen the pain and favor recovery in acute iritis, whatever may be its origin. HIRSCHMANN.

According to HERTEL (18, **Effects and actions of subconjunctival injections of salt**), after a subconjunctival injection of a 2½ to 5%, stronger, salt solution, a concentration in therapeutic use, there follows a rise of the osmotic concentration of the aqueous which is to be referred to an increase of the electrolytes. Of 141 eyes with choroiditis, 77 were treated with and 64 without injections of salt; 61 of the former and 39 of the latter improved. Of 102 eyes with central choroiditis from excessive myopia treated with injections, 69 were improved; of 76 treated otherwise 45 were improved. Improvement followed injection in 22 eyes with hemorrhagic

retinitis in only 36%, while it was 48% in 27 eyes treated without injection. Of 55 cases of opacities of the vitreous 41 were improved, after injection of salt in 21 eyes in 80.6%, without such injection in 34 eyes in 70%. In 35 cases of detachment of the retina treated with injections, out of a total of 61 the retina was replaced in 20.3% and improvement obtained in 24.5%. From these studies it appears that in non-bacillary diseases of the fundus the number of improved cases has been increased by the introduction of the subconjunctival injection of salt, but that the degree of improvement obtained is not greater than formerly.

According to the observations of ADAM (19, **The value of dionin treatment in diseases of the eye**), dionin in no way deserves the enthusiasm that it has received and is still receiving in many places in the treatment of diseases of the eye. It certainly does good service as an analgetic and resorbent in a certain class of cases, but is uncertain as an analgetic and as a resorbent is no better than older methods, or than the natural power of resorption.

According to LANGENHAN (20, **Contributions to ophthalmotonometry**) Schioetz's tonometer is a useful instrument for the clinical determination of the intraocular tension. In the normal eye this instrument gives the average tension as 21.0*mm* of mercury; it is not changed by holocain or atropin, is perhaps slightly changed by cocain, and is distinctly reduced by pilocarpin and eserin. The eyes of patients suffering from exophthalmic goitre show a tendency to a slight hypertony. As intraocular tumors in the first stage are not rarely associated with lowered tension, the condition of the tension is not to be considered of decisive importance in itself in the differential diagnosis from serous detachment of the retina. The reduction of tension by pilocarpin or eserin in glaucomatous eyes differs greatly.

According to LOEHLEN (21, **Valuation of optico-ciliary resection**) optico-ciliary resection may be taken into consideration in cases of painful blind eyes in which other operative procedures promise, or have produced, no result and the choice is confined to enucleation and resection. Resection affords the advantage that, if it succeeds in permanently relieving the pain, it yields a much better cosmetic result. In primary glaucoma

experience in regard to the relief of the pain after the operation is not favorable, while in secondary glaucoma, chronic iridocyclitis, phthisis dolorosa, vesicular keratitis, and filamentous keratitis the pain is frequently relieved. Even the cosmetic result leaves much to be desired because the operation is unable to prevent a later phthisical shrinking. A sympathetic inflammation cannot be obviated.

BEST (22 and 23, **Injury to the eye by ultraviolet rays**) says that under the ordinary conditions of life the ultraviolet rays are harmless to the retina, but that the intensity of the light rays may injure the eye.

KROTOW (24, **Hallauer's protective glasses**) prescribed Hallauer's protective glasses in 27 cases in which "ordinary protective glasses had been prescribed." The patients were suffering from conjunctival catarrh, macula of the cornea, trachoma, phlyctenular disease, and blepharitis with photophobia and lachrymation. The patients were all pleased and gave these the preference over all other forms of protective glasses. The signs of irritation and the lachrymation became less. The best results were obtained with glasses of medium saturation. Krotow concludes from these observations that Hallauer's theoretical reasoning is confirmed practically.

HIRSCHMANN.

III.—REMEDIES AND INSTRUMENTS.

25. PETERS, L. C. **The use of tuberculin in ophthalmic practice.** *Medical Record*, Jan. 1, 1910.

26. ELLIOTT, R. H. **A note on alypin.** *Ophthalmoscope*, Oct., 1909.

27. CHIARI, C. **A derivate of anilin (paraphenilendiasorcine) used as the base of a cosmetic, and the visual troubles it produces during the process of its oxidation.** *Presse med. Italienne*, Feb. 2, 1910.

28. RHOADS, J. N. **A way to remove all the aberrations from frameless glasses.** *Ophthalmology*, April, 1910.

29. RHOADS, J. N. **A one-degree astigmatism scale.** *Ophthalmic Record*, May, 1910.

30. HARMAN, BISHOP. **A new retractor for use in excision of the lachrymal sac.** *Ophthalmoscope*, Nov., 1909.

31. TOOKE, FREDERICK. **A new forceps for the removal of the anterior capsule.** *Ophthalmic Record*, May, 1910.

PETERS (25, **The use of tuberculin in ophthalmic practice**) believes that many of the unsatisfactory results in the use of tuberculin as a diagnostic and therapeutic agent are due

to faulty technique. For diagnosis the Calmette method should be used in eyes free from disease. Solutions of one-half to one per cent. of old tuberculin should be used for not more than two instillations on account of the dangers of conjunctivitis, but the von Pirquet test is probably the most reliable and safest. In the treatment a constant daily temperature chart should be kept while internal doses should not be over 0.0001*mg* of T. R. and never repeated until all reaction is gone. The dose is then gradually increased. He uses von Ruck's watery extract and never has seen unpleasant results. ALLING.

ELLIOT (26, **A note on alypin**) gave alypin a trial in the Government Ophthalmic Hospital in Madras. It was first tried on a cataract morning. There were nineteen extractions. It was used in 2% solution The routine adopted was the same as for 4% cocaine. Five instillations during twenty minutes. The first case "squealed like a rabbit in a gin," and there was free hemorrhage into the anterior chamber. The second case felt great pain and had similar hemorrhage. The third case had a final dose of cocain but was not anæsthetized by these drugs. Again there was free hemorrhage. Cocain was not adopted, and the remaining operations were free from pain. Elliot was very dissatisfied with the drug, and has returned to the safe and certain cocain.

T. HARRISON BUTLER.

CHIARI (27, **A derivate of anilin (paraphenilendiasorcine) used as the base of a cosmetic, and the visual troubles it produces during the process of its oxidation**) has collated from literature all of the observations made concerning the harmful influence exerted upon the eye by cosmetics containing anilin and paraphenylendiamin, a derivate of anilin. He then reports a case of visual disturbance in one eye in a woman 48 years old from the use of a hair dye containing paraphenylendiamin, in which the vision became reduced to counting fingers at about 1*m*, with a large central scotoma and an optic neuritis. Treatment with aspirin and discontinuance of the use of the hair dye finally restored the vision to normal. He quotes a case reported by the reviewer of visual disturbance caused by the use of hair dye and conjectures that it was not the anilin, but its derivate, that caused the trouble. The

reviewer has since then seen a monocular optic neuritis in a woman 50 years old caused by the use of a hair dye, which was ascribed by an ophthalmologist to syphilis, was treated with mercury, and finally resulted in a partial optic atrophy.

BERGER.

RHOADS (28, **A way to remove all the aberrations from frameless glasses**) recommends the bevelling of lenses to an angle of 45 degrees on the inner surface, to prevent the reflection of horizontal rays and diminish the chromatic aberrations. He advises as a further precaution blackening the edges and the gold of the spectacle frames. BLAKE.

RHOADS (29, **A one-degree astigmatism scale**) recommends a scale divided into single degrees, instead of five-degree segments, and extended into a circle. To this he adds a travelling index and notched cylinder rings, locked by an axis pin. His method seems to be impracticable for the reason that the optician cannot grind cylinders within one degree and because lenses cannot be kept absolutely rigid before the eye. BLAKE.

HARMAN (30, **A new retractor for use in excision of the lachrymal sac**) has invented a new retractor which combines the functions of both Axenfeld's and Mellor's retractors in one instrument. We obtained one on approval but found that, to introduce it, it was necessary to make the incision at least twice as long as is sufficient. The bleeding was excessive until it was removed, which was a difficult and painful process, so we still use the simplest form of retractor —two silk sutures are passed through each lip of the wound.

T. HARRISON BUTLER.

The instrument devised by TOOKE (31, **A new forceps for the removal of the anterior lens capsule**) is 8*cm* long with an extension arm set at an angle of 120° and curved to correspond to the anterior curvature of the lens, thus allowing uniform pressure on the latter. At the toe and heel of each blade are sets of fine interlocking teeth. The space between the teeth is 5*mm*, thus corresponding to the diameter of the average pupil. In hypermature cataracts the writer thinks the cystotome more conservative and also when operating upon an unruly patient. BLAKE.

Sections IV.–VII. Reviewed by Dr. ABELSDORFF, Berlin.

IV.—ANATOMY.

32. COATS, G. **On the occurrence of misplaced derivatives of the secondary optic vesicle in congenitally abnormal eyes.** *Ophthalmoscope*, Nov., 1909.

33. BRIBACH, E. **The central canal of the vitreous.** *Archiv f. Ophthalmologie*, lxxvi., i., p. 203.

34. SEEFELDER, R. **Contributions to the histogenesis and histology of the retina, of the pigment epithelium, and of the optic nerve.** *Ibid.*, lxxiii., iii., p. 419.

35. MAWAS, J. **The anatomy and physiology of the ciliary region of the retina. Secretion of the aqueous. Origin of the fibres of the zonule of Zinn.** A. Rey, 1910, 126 pages.

36. LEWITZKY. **Anatomy and pathology of Tenon's capsule.** Odessa, 1910. 162 pages.

37. TOOKE, F. B. **On so-called doubling of the puncta lachrymalia.** *Ophthalmology*, April, 1910.

COATS (32, **On the occurrence of misplaced derivatives of the secondary optic vesicle in congenitally abnormal eyes**). There were observed as abnormalities: pigment epithelium, retina, neuroglia, replacing the unpigmented epithelium, of the ciliary body; unpigmented epithelium, retina, neuroglia, replacing the pigment epithelium of the choroid; pigment epithelium, unpigmented epithelium, and retina in the optic nerve. These diverse observations can be linked together by the hypothesis that in congenitally abnormal eyes a portion of one layer of the secondary optic vesicle may develop into structures which normally originate in the other, or in a different part of the same layer. This valuable paper, which is well illustrated, cannot be abstracted in the space at our disposal, and should be read in the original.

T. HARRISON BUTLER.

BRIBACH (33, **The central canal of the vitreous**), in his studies concerning the central canal of the vitreous, dissected away only the posterior part of the sclera and of the choroid from the equator in order to avoid dragging upon the papilla or injuries by dissection of the anterior portion of the membranes of the eye. The entrance of the optic nerve with the surrounding scleral ring and the corresponding part of the choroid was then separated from the retina or vitreous with scissors. A solution of hæmatoxylin is then pressed from the

papilla to the nasal side of the posterior capsule of the lens. He considers the objections raised by Wolfrum to the existence of a canal in the vitreous to be untenable and maintains that a hyaloid canal is present in the developed eyes of pigs, cattle, sheep, and men.

According to SEEFELDER'S (34 **Contributions to the histogenesis and histology of the retina, pigment epithelium, and of the optic nerve**) studies concerning the first development of the retina in man, the purely epithelial stage is to be met with only in the stage of the primary optic vesicle. The first signs of pigment development appear in the form of minute drops or short rods. In an embryo 10*mm* long the retina divides into two large layers, an outer nuclear layer and an inner layer without nuclei, the so-called marginal veil of His. The latter is not absolutely without nuclei, but through it are scattered some epithelial nuclei from cells which have migrated from the nuclear zone. These cells of retinal or ectodermal origin are also found in the then small vitreous space. The so-called marginal veil is developed before any signs of a development of nerve fibres is demonstrable with the ordinary staining methods. The first traces of the development of the layer of nerve fibres and ganglion cells he finds in a human embryo 10*mm* long. The first differentiation of the ganglion cells takes place not in the entire extent of the retina, but in the portions that later become temporal and lower. Fine nerve fibres extend from most of the cells which bend in a parallel direction to the surface of the retina. Later dendritic processes extend from the cells and not rarely a diplosoma can be demonstrated in the young cells. With the development of the dendritic processes begins the appearance of the inner plexiform layer. The development of the Nissl granules takes place a short time before or after the completion of intrauterine life.

The development of the ganglion-cell layer appears to be already ended when the outer granular layer begins, at the end of the third month. The inner granular layer takes a middle place, it presents at the same time a considerable thickness, but requires a longer period of cell-growth. The outer plexiform layer is, the same as the inner, a product of the neighboring granular layers.

The development of the area and fovea centralis of the retina is markedly hastened before that of the rest of the retina. The area centralis, recognizable through the greater thickness of the ganglion-cell layer, develops in the fourth month and the first signs of the fovea appear toward the end of the sixth fœtal month. When the cones in the fovea itself show only a rudimentary development the finest and highest cones already lie around it. In the development of the cones he failed to see the tubercles described by Chievitz which he thinks were artificial products.

The increase of bulk of the retina appearing in the later stages of development takes place, he thinks, through an increase of the thickness of the layers without nuclei.

The optic nerve is followed from the first development of the pedicle of the optic vesicle to the complete intergrowth of nerve fibres. Free mesodermal cells penetrate into the pedicle and the interior of the eye with the hyaloid artery that lies in the grooved end of the optic pedicle, where they become mesodermal vitreous cells. Then follows the description of the development of the glia: (1) of the glia sheath of the hyaloid artery, which surrounds the artery without close tissue connection; (2) of the central and peripheral glia sheath.

The formation of the physiological excavation commences in very young embryonal life; in embryos in which the intergrowth of the optic nerve with nerve fibres has been completed but a short time, papillæ are met with both with and without excavations. In conclusions are statements concerning the thickness, length, and form of the optic nerve during embryonal development. The S shape of the optic nerve is present in the third fœtal month.

Mawas (35, **The anatomy and physiology of the ciliary region of the retina. Secretion of the aqueous. Origin of the fibres of the zonule of Zinn**) expresses the view based on his studies of the anatomy and physiology of the pars ciliaris retinæ that the pigment cell layer which presents in some ways an outward similarity to gland cells has no such function. In the cell layer internal to the pigment layer he differentiates cells without pigment and radiating fibres. He confirms the view of the reviewer that the former alone

are digested in a pepsin solution and are therefore different from the latter. The former cells he looks upon as glandular cells which secrete the aqueous; at the same time they may serve as protective organs against the transmission of cytotoxic material to the lens. The radiating fibres of the pars ciliaris he holds to be the original fibres of the zonule of Zinn. Zonula fibres arise, he thinks, from the entire surface of the ciliary body, both the eminences and the depressions.

BERGER.

LEWITZKY (36, **Anatomy and pathology of Tenon's capsule**) divides his monograph into three parts: (1) The anatomy of Tenon's capsule, (2) Experimental pathology, and (3) Clinical diseases of Tenon's capsule. The first section contains a review of anatomical works on the subject, the methods of study, the anatomy of the periosteum of the orbit, the general muscular aponeurosis, Tenon's capsule, the orbital connective-tissue bands, Tenon's space, and the orbital fat; a review of works on the physiology of Tenon's capsule; the author's own anatomical studies of Tenon's capsule and of the connective tissue formations in the orbit; and the elastic tissue in the orbit. The second section contains a description of the author's experimental pathological studies and their results. In the third section is an analysis of the literature on diseases of Tenon's capsule, descriptions of the clinical pictures of forms of disease and their treatment.

It appears from this work that Tenon's capsule differs from the surrounding tissues. It consists of numerous tissue layers. In the retrobulbar fat a thin connective-tissue membrane is constantly present which the author names the fascia retrobulbaris and is inclined to regard as homologous to the retractor muscle. A special Tenon's space does not exist between the globe and the capsule because the space is filled with loose connective tissue. The capsule is formed of plates of elastic fibres arranged parallel to the surface of the sclera. The function of the entire connective-tissue apparatus of the orbit is to fix the eye in its position in a condition of rest and, in common with the muscles of the eye, to regulate its movements and those of the surrounding tissues.

HIRSCHMANN.

Examination of TOOKE's (37, **On so-called doubling of the**

puncta lachrymalia) first case revealed a small slit about 3*mm* internal to the true punctum and in the same line. It was not elevated as the punctum is and its edges were in apposition. Running from the second opening to the caruncle was a small musculo-membranous band, a congenital symblepharon. There had been no previous trouble with the eyes and the patient complained only of headaches and epiphora. The second case was similar to the first except that the abnormal opening was to the outer side of what the author had considered to be the true punctum. He ascribes the condition to an incomplete involution of the ectoderm during fœtal life.

BLAKE.

V.—PHYSIOLOGY.

38. BASLER, A. **Vision of movements. Fifth article. Studies concerning the simultaneous apparent movement.** *Arch. f. d. gesammten Physiolog.*, 132, p. 131.

39. DITTLER, R., and ORBELI, L. **The re-establishment of even brightness to places on the visual field unequally separated.** *Ibid.*, p. 338.

40. HABERLANDT, L. **Studies of optic orientation in space and of precision of the memory of the elements of the same.** *Zeitschrift f. Sinnesphysiologie*, 44, 4, p. 231.

41. BERGER, E. **Fusion of retinal images which in vision through the stereoscope fall upon places in the retina that do not correspond.** *Ibid.*, 44, 5, p. 315.

42. OVIO, G. **The perspective in its relations to vision and to reading.** *Arch. f. Ophthalmologie*, lxxv., 1, p. 129.

43. LEVINSOHN, G. **The influence of the external muscles of the eye upon the intraocular tension.** *Ibid.*, lxxvi., 1, p. 129.

44. EDRIDGE-GREEN, F. W. **The theory of vision.** *Lancet*, Oct. 2, 1909.

45. GERTZ, H. **The secondary katadioptric image of the eye.** *Skandinav. Arch. f. Pysiolog.*, 22, p. 299.

46. MARINA, A. **The ciliary ganglion as the peripheric centre of the reaction of the pupil to light and of Argyll-Robertson's phenomenon.** *Presse Medicale*, 1910, No. 51.

47. NOISCHEWSKY, K. O. **Historical and critical review of the methods of testing vision.** *Wojenno Medic. Journ.*, Jan., 1910.

BASLER'S (38, **Vision of movements. Fifth article. Studies concerning the simultaneous apparent movement**) results are as follows: 1. If a large striped surface is moved with a rapidity of 3*mm* in a second behind a non-moving disk, the

centre of which is fixed at a distance of 30*cm*, after a short time the disk and not the striped surface will appear to move. 2. This result is the same when instead of the centre of the disk a fixed point near the same is used, or even one upon the screen itself. 3. With greater rapidity, 7*mm* to the second, the movement of the stripes is seen somewhat longer and with the apparent movement of the disk, which comes after some seconds, the true movement of the stripes is still perceptible. 4. After interruption of the movement comes a negative after-image of movement, movement in the reverse direction. Frequently there is at first a movement of the stripes, then of the disk, whether the centre of the disk or a neighboring point is fixed on. 5. With fixation on a point shiftable with the moved surface no after-image of movement followed the cessation of movement when the disk was plain, but did follow when the disk was replaced by a striped one. 6. The size of the disk had no appreciable influence on the apparent movement.

DITTLER and ORBELI (39, **The re-establishment of even brightness to places on the visual field unequally separated**) have investigated the correctness of Fechner's theory that two stimulations acting on two places of different excitability produce an equally great stimulation when the two degrees of excitation are inversely proportional to the two degrees of excitability, *i. e.*, whether for two places in the retina, one of which is less weary than the other, a proportion is always to be found in the degree of stimulation acting upon them by which, independently of the absolute degree of stimulation, the excitement of both places is equally great. The results of their experiments contradict this proposition and they propound the following: If one wearied and one not wearied place on the retina are irradiated with two lights of different intensities so that the same brightness is present in both, an inequality of brightness will immediately appear when the intensities of the two lights are increased or diminished in the same proportion. An increase of the intensities results in greater brightness, a proportional decrease in greater darkening of the place on the retina previously wearied.

HABERLANDT'S (40, **Studies of optic orientation in space and of precision of the memory of the elements of the same**)

three series of experiments were as follows: 1. To designate as accurately as possible the position of a light in a dark room by means of the movements of the eyes exclusively with the head fixed. 2. To do the same by means of movements of the head and eyes. 3. To do the same with movements of the head alone. Even if these different kinds of movements be reproduced by the same individual constantly with differing accuracy for the purpose of orientation in space, a precision scale thus formed, has no value as to the power of reproduction by another individual. If the experiment is varied so that both the remembrance of the corresponding sensations of movement and of the sensations of the final condition of contraction of the muscles have ceased to serve as guides, the orientation is still more incomplete. This makes clear the importance of these sensations in the optic orientation in space.

BERGER (41, **Fusion of retinal images which in vision through the stereoscope fall upon places in the retina that do not correspond**) describes a sign of fusion of images projected on non-identical places of the retina. On a stereoscopic chart a single square is marked for one eye and two for the other, which should form a checkered position by the union of the images in both eyes. But in fact the eye fixing a point above the one square executes a roll movement and fuses the image of the single square with one of the squares seen by the other eye. This disturbance of the co-ordinate eye movement takes place unconsciously in the interest of fusion of two images projected on two homogeneous, but not identical, places on the retina. To produce this fusion only one eye undergoes a rotation which may amount in the vertical meridian to 1.5, in the horizontal to 2.5. Berger recalls the persistence of single vision when a prism is held in front of one eye, which is to be explained only by a movement for the purpose of avoiding diplopia. With the stereoscopic experiment the roll movement of the eye follows as if the image of the square was the double image of the other identical square.

According to OVIO (42, **The perspective in its relations to vision and to reading**), the changes in size and form of images seen through perspective reduce the legibility of the alphabet.

Thus the perspective exercises an influence upon reading when the printed page has a certain extent until the vision is reduced about ½. The movements of the eyeball in reading, the movements of accommodation, the changes in the size of images through changes of distance he considers advantageous. Changes of the angle of inclination are harmful because of the perspective thus produced. The movements and changes are rather harmful for binocular vision because of the different removal of the two eyes from the point of fixation. As the perspective is very prejudicial in reading it must be taken into account in the hygiene of the eye; the letters should be large, the lines short, the books small, and the inclination of the book should be as little as possible in reading.

LEVINSOHN'S (43, **The influence of the extrinsic muscles of the eye upon the intraocular tension**) experiments were made on curarized cats and rabbits. On one side the muscles were stimulated from the orbit, on the other the stimulation was applied to the cranial nerves and the intraocular tension was measured by means of a manometer connected with a canula introduced into the anterior chamber. Slight muscular contractions did not influence the intraocular tension; strong ones did. In order to render increase of the blood pressure through stimulation of the vasomotors impossible, the stimulations were also applied after section of the spinal cord just below the medulla oblongata without obtaining results appreciably different. From these experiments Levinsohn draws the conclusion that an increase of intraocular tension never has taken place and never can do so in convergence, because the muscular action is too slight. The behavior of the intraocular tension of the human eye during movement was studied by means of Schioetz's tonometer and no change of tension noted. He concludes from this that during near work an increase of tension is never induced by the mucles of the eye and that the elongation of the axis in myopia is never due to stretching of the globe consequent upon increased tension.

EDRIDGE-GREEN (44, **The theory of vision**). It has long been felt that both the Young-Helmholtz and the Hering theories of color vision are thoroughly unsatisfactory, neither explaining all the facts. Edridge-Green has elaborated a new theory

which seems much more satisfactory than either of the older hypotheses. The author assumes that the cones of the retina are insensitive to light, but sensitive to chemical changes in the visual purple. Light falling upon the retina liberates the purple from the rods, and it is diffused into the fovea, and other parts of the rod and cone layer of the retina. The decomposition of the purple by light chemically stimulates the ends of the cones, a visual impulse is set up, which is conveyed to the brain. The visual impulses caused by different rays of light differ in character, as the rays in wave length. In the impulse itself we have the physiological basis of the sensation of light, and in the quality of the impulse the physiological basis of the sensation of color. The quality of the impulse is perceived by a special perceptive centre in the brain within the power of perceiving differences possessed by that centre. Kühne's work on the visual purple (*The Photochemistry of the Retina and on the Visual Purple*, by W. Kühne, translated by M. Foster, 1878) is brought forward in support of Edridge-Green's theory, and the anatomy of the retina is explained in the light of the theory. The author found visual purple between the cones in the retinæ of two monkeys which had been left 48 hours in a dark room. The yellow spot was the reddest part of the whole retina and the visual purple was seen to be between and not in the cones.

In discussing the evolution of the color sense the author assumes that at one time in past ages all objects were seen uncolored as in a photograph. The visual centre had developed, but not the color-perceiving centre. When the latter appeared the first colors to be differentiated would be those whose rays differed most in wave length, a tinge of red appearing at one end of a gray spectrum, a tinge of violet at the other. As the centre developed, such a large difference was unnecessary; the violet and red spread till they met in the centre. Man now had the vision of the so-called "dichromatics," persons who see only violet and red. The ends of the spectrum may or may not be shortened in such cases. If the red end be shortened, the individual may look at a bright red light emitting rays of a certain refrangibility and see no light at all—a most dangerous man to be on the bridge of a steamer

or on the footplate of a locomotive. And yet such a man might pass the wool tests! The next stage is when a third color is perceived; such men see red, green, and violet, and are classed as "trichromic." They do not see yellow and blue as distinct colors. About 1.5% of all men are bichromic. Very few of the common tests will unmask them; they match colored wools with ease. Sir William Ramsay and Sir J. J. Thomson, belong to this class. The class are highly dangerous when at sea or on an engine. The fourth, fifth, and sixth colors are now evolved. The last stage is reached by few, indigo being the final color to be separated in the spectrum. The author states that he is unaware of any fact of vision which does not support his theory.

The paper is all too short, and those who read it will wish to read all the author's published work on the subject of vision and more especially on color vision.

T. HARRISON BUTLER.

GERTZ (45, **The secondary katadioptric image of the eye**) studied the changes of the secondary katadioptric image during accommodation, in which a first reflection from the posterior surface of the lens and a second from the anterior surface of the cornea are subjectively visible. After development of the dioptric relations which define the dependence of the secondary image upon the dioptric system it is shown that faults of centring of the pupil, or of the refracting surfaces, are prejudicial to the visibility of the secondary image. In consequence of its dependence upon the posterior surface of the lens the secondary image affords a new means by which to study the accommodative changes of that surface. The results obtained in this way regarding the accommodative displacement, as of the centre of curvature of the posterior surface of the lens, confirm the idea that the posterior pole of the lens undergoes no marked axial displacement during accommodation, and that the curvature of the posterior surface of the lens is accommodatively increased.

MARINA (46, **The ciliary ganglion as the peripheric centre of the reaction of the pupil to light and of Argyll-Robertson's phenomenon**) concludes from his experimental and clinical studies that the ciliary ganglion may be the centre for the light reflex of the pupil. He explains the pupillary contraction

during convergence by the dragging upon the fibres of the radix brevis, which enters the globe in the temporal portion of the sclera, yet adds that complex causes contribute to the production of this symptom. The Argyll-Robertson symptom is explained through disease of the peripheral neuron, which is usually of syphilitic origin.

NOISCHEWSKY (47, **Historical and critical review of the methods of testing vision**) gives a complete review of the methods of testing vision and of the principles underlying the tests. He shows that the minimum separabile is by no means always the suitable principle for the practical testing of the vision needed for different practical purposes; that, for example, in shooting, the principle of the minimum visibile is more correct; that after testing, according to this principle, the set of squares, or of Landolt's rings, the degree of illumination and also of the contrast between the fundus and the characters is to be taken into account; that letters are more easily read by astigmatics and by those suffering from ataxia of vision than circles, squares, and similar characters. The ataxic suffers from monocular polyopia. A good sharp-shooter counts squares or circles more accurately than he reads the corresponding letters. A person suffering from ataxia of vision, on the contrary, distinguishes letters better than he counts squares.

Of 314 persons whose vision was tested the author found in 13 (4%) better vision in counting squares, or other single-shaped characters, than with test charts with letters; in 175 (56%) the vision was the same by both methods of testing; and in 125 (40%) the vision was better for letters than for characters of a single shape

HIRSCHMANN.

VI.—REFRACTION AND ACCOMMODATION

48. HARMAN, BISHOP. **A case of extreme hypermetropia.** *Ophthalmic Review*, Aug., 1909.

49. HERTEL, F. **Replacement of the operative correction of high myopia by a combination of glasses.** *Arch. f. Ophthalm.*, lxxv., iii., p. 586.

50. LOHMANN, W. **The theory of the genesis of myopia.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., p. 417.

51. WIEGMANN, E. **An extraordinary case of paralysis of the accommodation after diphtheria.** *Ibid.*, i., iv., p. 454.

52. KUSCHEL, J. **The mechanics of the overstretching of the sclera, retina, and choroid, particularly in elongation of the axis of the eye.** *Zeitschrift f. Augenheilkunde*, xxiii., i., 5–6, p. 493.

53. MEYERHOF, M. **Myopia in illiterates, with astigmatism and corneal opacities in Egypt.** *Centralbl. f. prakt. Augenheilk.*, xxxiv., p. 193.

54. GOLDZIEHER, W. **The operation for high myopia.** *Medizinische Klinik*, No. 17, 1910.

55. BONNEFON. **The clinical value of surgical treatment of myopia by the removal of the transparent crystalline lens.** *Arch. d'ophtalmologie*, xxx., p. 281.

HARMAN (48, **A case of extreme hypermetropia**). The author's case, a boy aged 12, had a hypermetropia of 20 D. It is very rare to find a case exceeding 10 D., in fact Leber found only four in 80,000 patients, and Harman has seen only this case in over 1000 school children. The best vision obtained was $\frac{6}{24}$. The refraction was the same in both eyes.

T. HARRISON BUTLER.

HERTEL (49, **Replacement of the operative correction of high myopia by a combination of glasses**) declares that in a myope of 20 D. the retinal image is 1.3 as large after removal of the lens as it is with correction of the myopia with glasses. A weakly accommodating myope of 20 D. has retinal images three times as large in reading without glasses as in reading with −16 D., when the object is held so that the same amount of accommodation is used. The same myope has retinal images twice as large in reading without a glass as with a +5 D. glass after operative correction. Further disadvantages make themselves felt in vision with the moved eye, the astigmatism of oblique bundles of rays and the increasing barrel-shaped drawing toward the margin of the field. The enlargement of the image of the object, the principal advantage of the operative correction, may be accomplished without the possible mishaps of an operation by a corrective system productive of an enlarged image made by Zeiss following the suggestion of the author, which consists of a convex lens as an objective and a concave lens as an ocular according to the type of the Dutch telescope, but is adjusted to the point of rotation of the eye in the individual cases. As the extent of the field decreases as the enlargement is increased an enlargement of from 1.25 to 1.3 is the best

suited for general use in high myopia. The improvement of vision corresponds to the action of the glasses in enlarging the image. In near vision and high myopia the divergence of the rays coming from the ocular reach a degree which can no longer be overcome even with a relatively great range of accommodation. A convex glass placed in front of the telescope lenses then permits work conveniently at the desired distance. In certain callings the retinal images may be maintained at the same size as those produced without a glass by close approximation of the object by the choice of a greater enlargement.

LOHMANN (50, **The theory of the genesis of myopia**) says that the progression of myopia takes place toward the end of the first and the beginning of the second decade of life, when the growth of the eye is slow as compared with that of the rest of the body. This slowing of the growth of the eyeball may be retarded by collateral hyperæmia from retinal work, and this increase in growth takes place at the posterior pole because the displacement of the optic nerve necessitated by the position of the eye increases the tendency to growth called for at the posterior pole, but as the distance of the fovea from the papilla is the same in the infant and the adult the surface growth is suspended; further the insertions of the muscles in the anterior segment of the globe may play an important part by the strengthening they afford the walls.

WIEGMANN (51, **An extraordinary case of paralysis of the accommodation after diphtheria**) observed, in a boy who had had diphtheria three years before and since then had been unable to read in school, paralysis of the accommodation of the right eye and dilatation of the pupil, with preservation of the reaction to light. Four years after the diphtheria the paralysis of the accommodation disappeared, but the pupil remained more dilated than the other.

According to KUSCHEL (52 **The mechanics of the overstretching of the sclera, retina, and choroid, particularly in elongation of the axis of the eye**), the laws of superficial tension which apply mathematically and physically at the posterior pole of the eye for the overstretching of the sclera are confirmed in the anatomical conditions, that the outermost layers of the sclera atrophy first and most strongly at the posterior

pole and diminish deeper and forward. As the pressure of the vitreous is greatest backward, the same meridional distortion must take place in the retina as in the sclera; the centre of the area of stretching is the macula region and the pressure of the vitreous flattens the perifoveal walls. The appearance of the central black spot in myopia shows that the tension of the outer layers is particularly great. The peculiarities of the construction of the choroid do not permit sufficiently anatomical agreement with the mechanical theory of superficial tension as regards itself. The elastic lamina undergoes a simple increase of surface in hypertension; on account of its slight extensibility it draws back from the optic nerve and draws the retina and choroid in sympathy.

MEYERHOF (53, **Myopia in illiterates, with astigmatism and corneal opacities in Egypt**) found in Egypt among illiterates only 15 out of 80 cases of myopia that had clear corneæ. All the patients were over 20 years of age, all degrees of myopia were present, the lower numbers of dioptres more than the higher. Among 915 Egyptians he found 211 emmetropes, 210 hypermetropes, 494 myopes. The relation of the condition of the refraction to that of the cornea showed that in myopia the percentage of clear corneæ and perfect vision was very slight. Out of 74 cases of corneal opacity of one eye, 65 of whom were emmetropic, hypermetropic, or slightly myopic in the other eye, 48 were myopic in the injured eye. A great preponderance of myopia in patients with corneal opacities, and of the latter among myopes, is present in Egypt. The corneal affections reduce the vision, induce greater straining to see, and, with the aid of the racial predisposition, bring about myopia. Prevention of conjunctival diseases in children must be the first step toward prophylaxis of myopia in Egypt.

GOLDZIEHER (54, **The operation for high myopia**) warns that this operation has not fulfilled all sanguine hopes and that mishaps have occurred. He operates in three sittings: (1) discission; (2) broad puncture of the anterior chamber after a few days; (3) discission of the secondary cataract some weeks later. He has never met with loss from glaucoma. Of course retinal detachment may occur from any factor that produces disease of the vitreous, but the following observation shows

the need of careful judgment concerning the connection between the operation and detachment. A patient who had been operated on successfully in one eye returned a year later for operation on the other. While lying on the operating table he was examined again with the ophthalmoscope and a fresh detachment was revealed in the eye about to be operated on. Eleven years later the retina of the eye that had been operated on became detached, and later became reattached again. What Goldzieher fears most is the rare occurrence of a fine opacity in the most anterior layers of the vitreous, which usually comes late, often after the lapse of several years, and injures vision badly. Renewed discissions are either without effect or render the condition worse.

BONNEFON (55, **The clinical value of surgical treatment of myopia by the removal of the transparent crystalline lens**) reports 31 cases of high myopia treated by removal of the transparent lens. The results in general were favorable; in only three cases was the final vision less than $\frac{1}{10}$. The operation is contra-indicated in patients more than 30 years old, in myopia of less than 18 D. in adults and of less than 16 D. in children.

BERGER.

VII.—MUSCLES AND NERVES.

56. CLARK, L. P., and TYSON, H. H. **Horizontal oscillations of the eyeball in certain rare types of pontine lesions resulting in seventh-nerve palsy.** *Medical Record*, Jan. 1, 1910.

57. BENNETT, A. G. **Ophthalmoplegia totalis (hysterical) cured by psychotherapy.** *Ophthalmic Record*, Jan., 1910.

58. GIESLER, H. **Partial muscle transplantation on the eye.** *Inaug. Dissert.*, Rostock, 1910.

59. LOHMANN, W. **A notable movement phenomenon of the eye.** *Klinische Monatsbl. f. Augenheilkunde*, xlviii., i., 5–6, p. 556.

60. GEBB and VOSS. **Clinical contribution to congenital hereditary paralyses of the eye muscles.** *Berl. klin. Wochenschr.*, No. 21, 1910, p. 260.

61. AUBINEAU, E. **Studies concerning the etiology of strabismus.** *Annales d'oculistique*, cxliii., p. 107.

In some types of traumatic and rheumatic palsies of the facial, the eyes according to CLARK and TYSON (56, **Horizontal oscillations of the eyeball in certain rare types of pontine**

lesions resulting in seventh-nerve palsy), when effort is made to close the lids, will show the well-known Bell's phenomenon, *i. e.*, the eyeballs roll upward or outward, but in more forcible attempts at lid closure both eyes begin a see-saw oscillation of from 40 to 60 to the minute. These movements are partly under control of the will. The region of the mechanism which is affected in producing this associate symptom is the tegmental area of the pons at or just below the sixth nerve nucleus. The paper is based upon three cases which show these phenomena.

ALLING.

BENNETT (57, **Ophthalmoplegia totalis (hysterical) cured by psychotherapy**) observed a complete hysterical paralysis of every muscle of the eyeball in a child 7 years old. It was cured in five days by suggestion in the form of encouraging talk while the child was asleep.

ALLING.

GIESLER (58, **Partial muscle transplantation on the eye**) reports two cases of paralysis of the abducens operated on by Hummelsheim. The first case was one of a man 56 years old with an old total paralysis of his left abducens. The superior rectus was split and the insertion of its outer portion transferred to a point between the insertion of the externus and the limbus where it was secured by sutures; the inferior rectus was likewise divided and the outer part of its insertion transferred to the lower margin of the externus. Immediately after the operation the position of the eye was *2mm* farther out and showed a slight movement outward. The mobility upward and downward had not suffered. Further observation of the course was interrupted by a paralysis of all the eye muscles caused by the breaking through of a carcinoma of the pharynx into the orbit. The second case was one of a man 57 years old who had a total paralysis of the right abducens caused by a blow, presumably associated with fracture of the base of the skull. Two months after the accident transplantation performed exactly as in the first case had at first a slight result. Two months later an almost extreme abduction was possible. In looking upward the movement of the right eye was somewhat impeded; the movement downward was unhindered. In this case the author

says that it cannot be excluded with absolute certainty that the paralyzed muscle might have regained its function without operation.

LOHMANN (59, **A notable movement phenomenon of the eye**) observed, in two patients with one blind eye deviating outward and upward and without pupillary reaction to light, that when the sound eye was covered with the hand the blind eye turned inward and downward with a slight rotation of the vertical diameter. He thinks that the consensual pupillary reflex stimulation can excite no movement of the iris in the deviated eye because of the terminal changes, and that the stimulation passes over in the peripheral nerve fibres to the accompanying fibres for the inferior oblique from the motor root of the ciliary ganglion, to relax immediately when the other eye is covered.

GEBB's and VOSS's (60, **Clinical contribution to congenital hereditary paralyses of the eye muscles**) observations of congenital paralyses of the eye muscles were as follows: (1) A woman 47 years old with paralyses, in the right eye, of the levator palpebræ, both obliqui, and the internal and superior recti; in the left, of the superior obliqui and the inferior and superior recti. (2) A girl 11 years old, the second child of the preceding; the paralyzed muscles in the right eye were the levator palpebræ, the abducens, the inferior oblique, and the inferior and superior recti; in the left, the three recti and the inferior oblique. (3) A girl 7 years old with paralyses, in the right eye, of the levator palpebræ, abducens, both obliques, and the superior rectus; in the left, of the superior and inferior recti and the inferior oblique. The signs of congenital paralysis common to all three cases were the absence of secondary contracture and of secondary deviation and the absence of diplopia.

AUBINEAU (61, **Studies concerning the etiology of strabismus**) publishes statistics of cases of strabismus examined by him in which the refraction, the general diseases, and anomalies observed in each patient are recorded, as well as the symptoms, either ocular or of general disease, found in the parents or brothers and sisters. Among 652 cases of convergent strabismus, he found hypermetropia in 347, hypermetropic astigmatism in 189, myopia in 28, and emmetropia in 88;

corneal opacities were present in 191 cases, changes in the fundus in 9, and congenital changes in 11. Among 93 cases of divergent strabismus, 41 had myopia, 27 myopia astigmatism, 11 hypermetropia and hypermetropic astigmatism, and 14 were emmetropic; corneal opacities were present in 28, changes in the fundus in 6, congenital anomalies in 4. In 60 cases strabismus was present in a parent, in 47 among the brothers and sisters; 23 had nystagmus, and a number had nervous diseases. He is inclined to think that nystagmus and strabismus may be of cerebral origin.

BERGER.

Fig. 1.

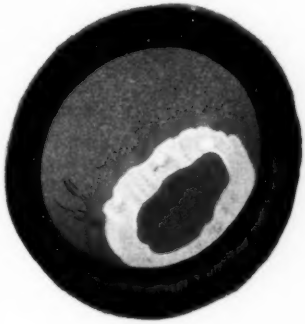
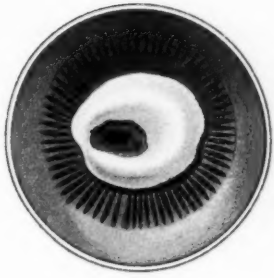


Fig. 2.



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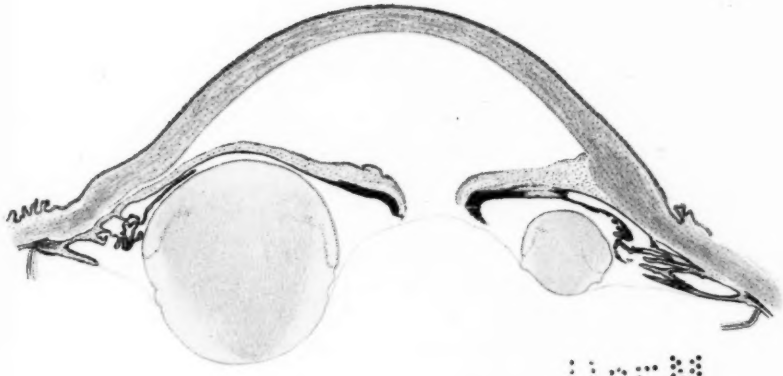

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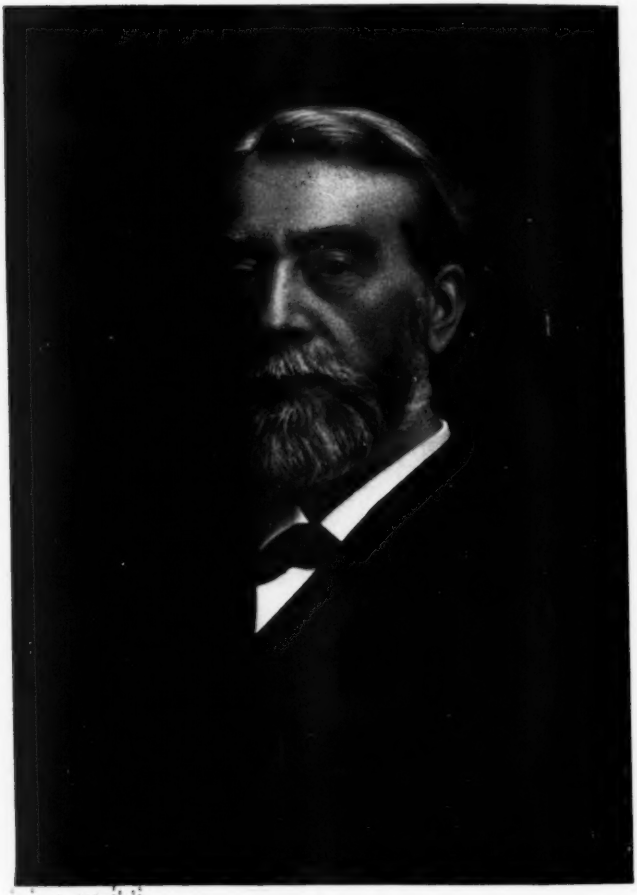

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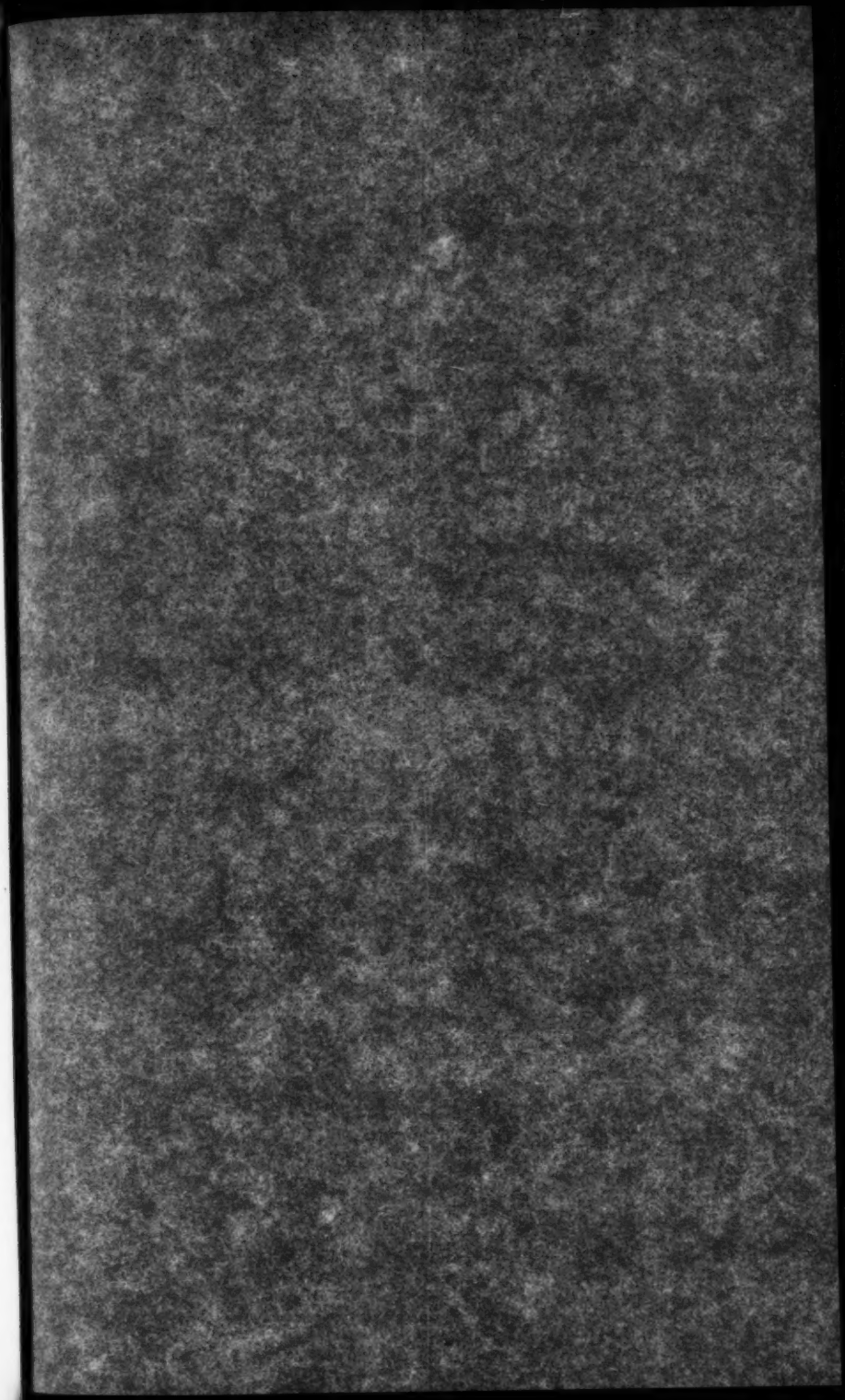
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